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Fig. 1A

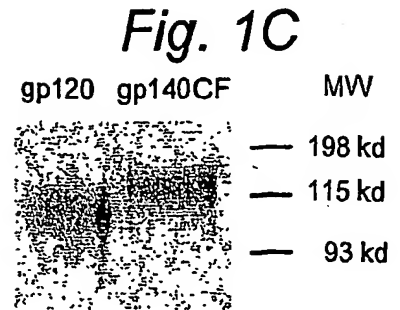
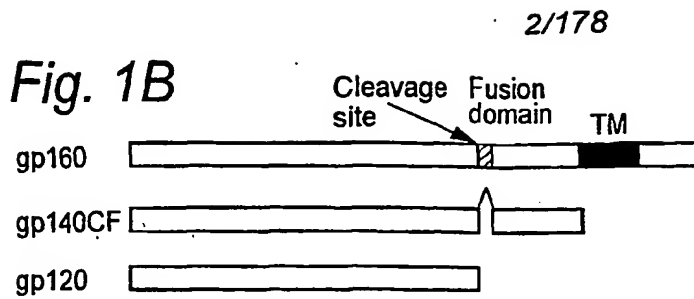


Fig. 1D

CON6.env (group M env consensus. This one contain five variable regions in env gene from 98CN006 virus, not in the public domain yet)

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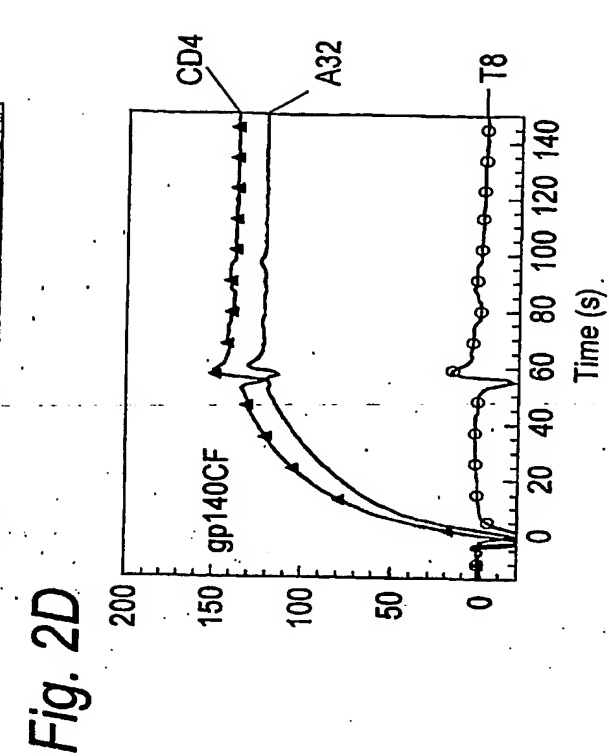
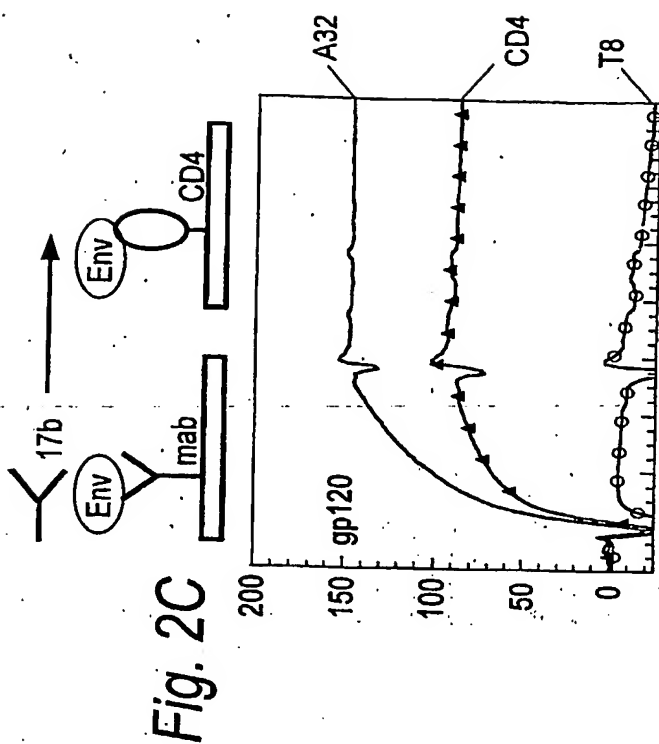


Fig. 2D

Fig. 2B

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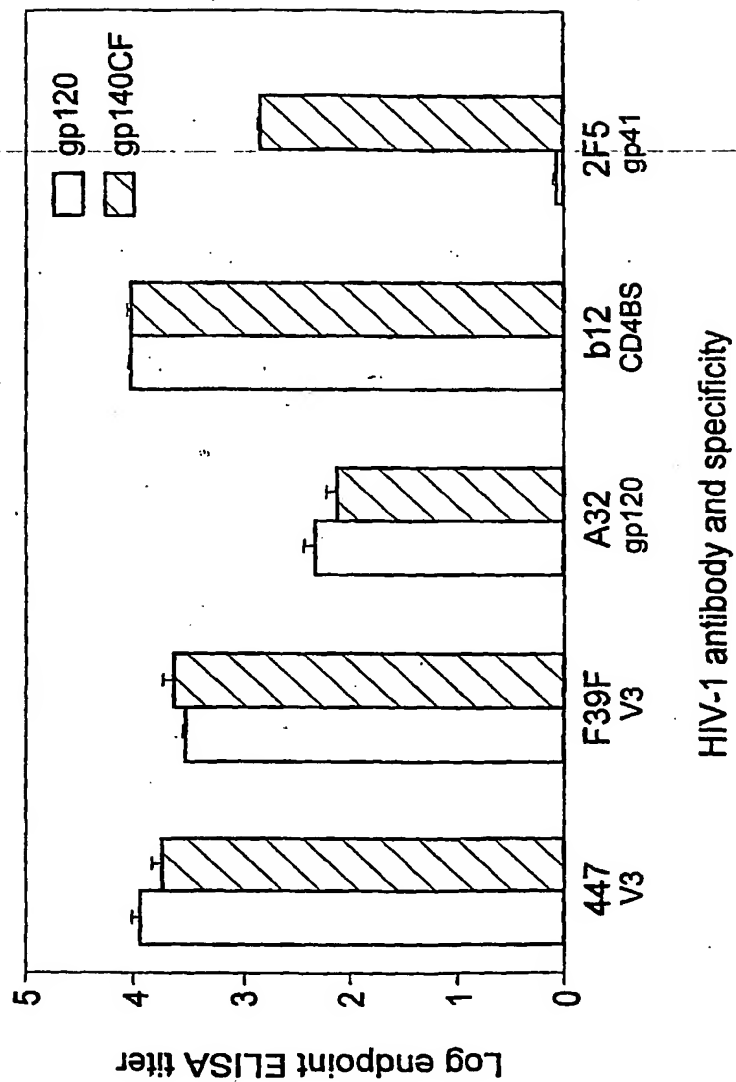
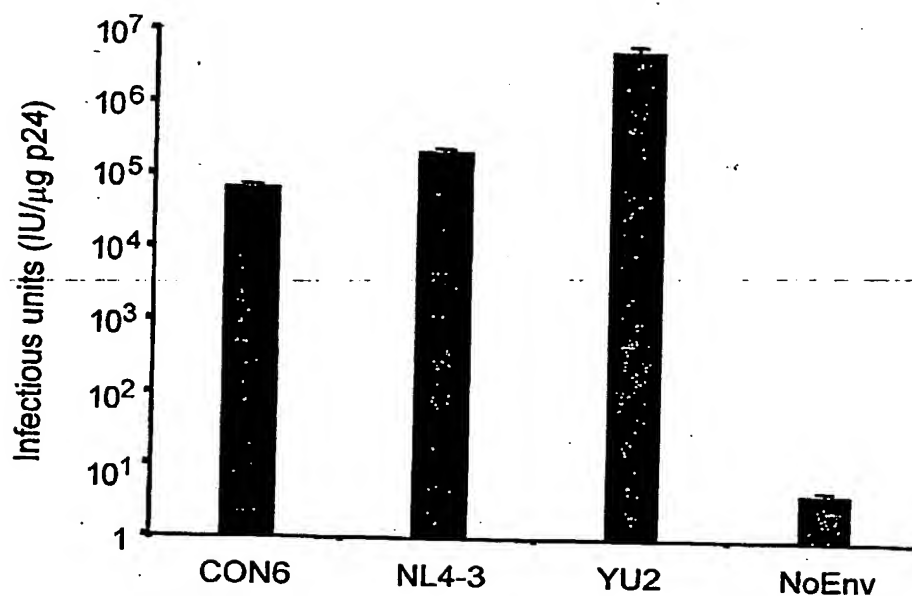
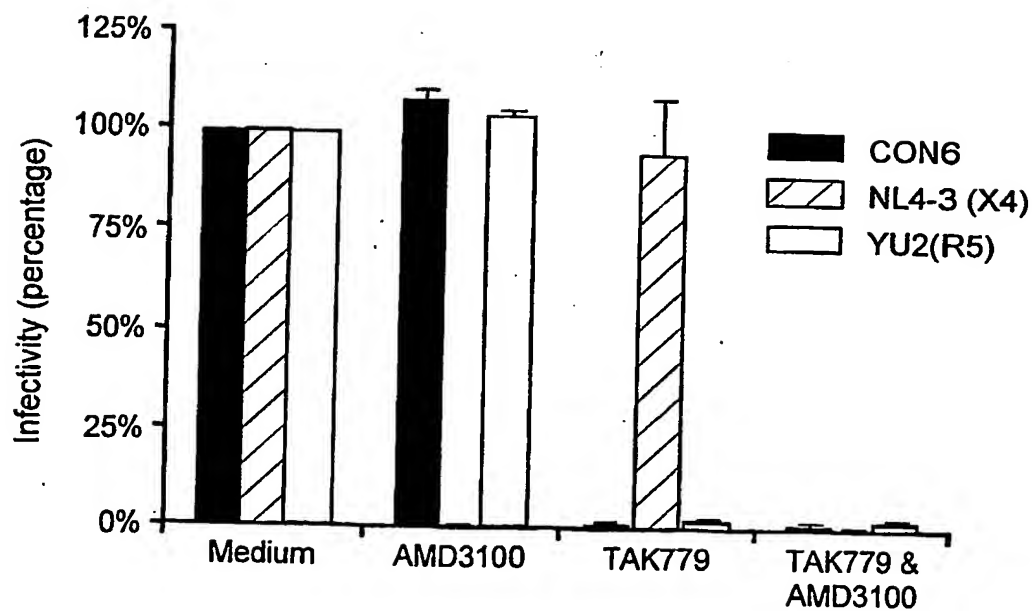


Fig. 2E

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*Fig. 3A**Fig. 3B*

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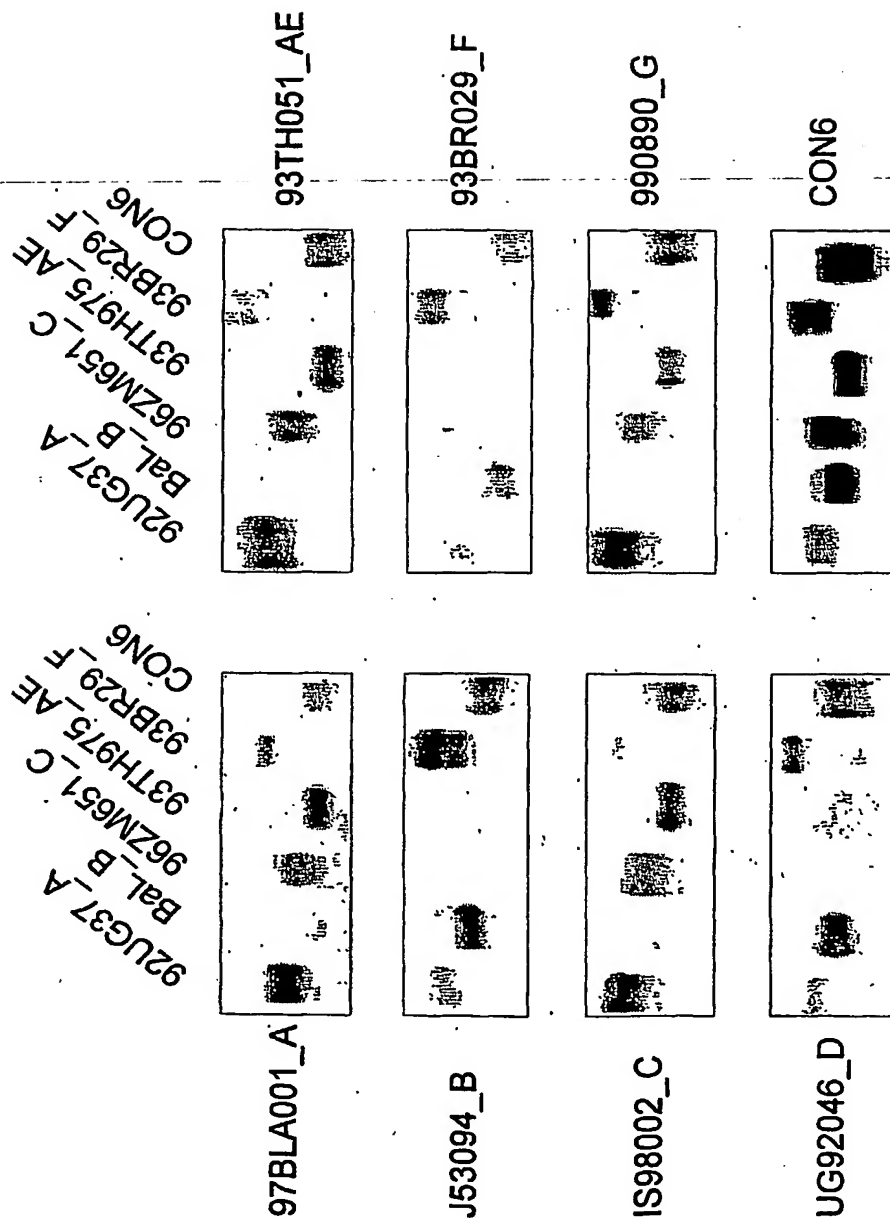


Fig. 4

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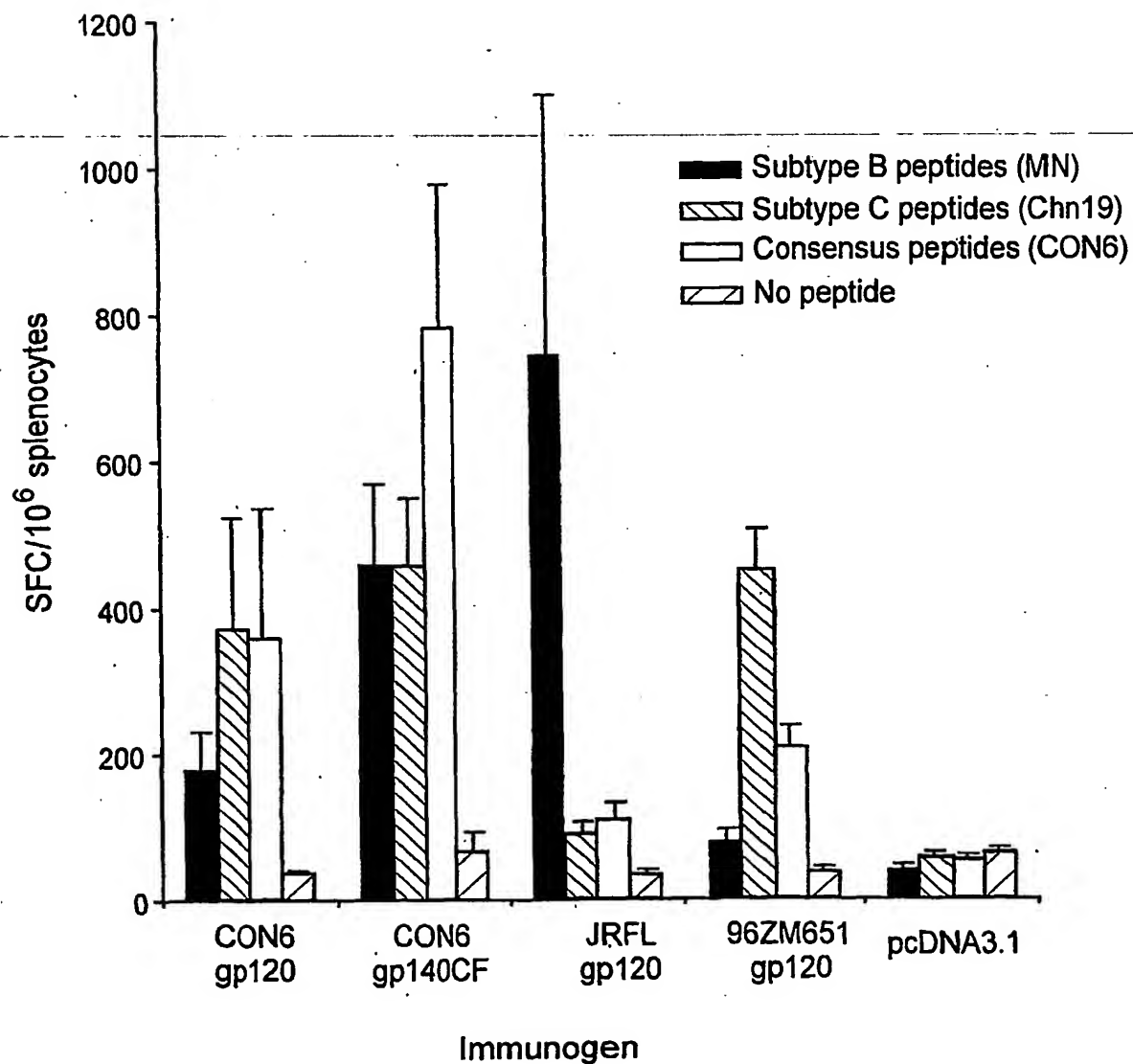
*Fig. 5*

Fig. 6A

[illegible]

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Fig. 6B

C.con.env (subtype C consensus env. The amino acid sequence is different from Los Alamos Database August 2002)

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C.anc.env (subtype C ancestral env)

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 PAGYAILKCNKTFNGTGPCNNVSTVQCTHGIKPVVSTQLLNGSLAEEIIIRSENLTDNAKTIIVQLN
 ESVEIVCTRPNNNTRKSMRIGPGQTFYATGDIIGDIRQAHCNISEDKNKTLQQVAEKLGHFPNKTITF
 EPSGGDLEITTHSFNCRGEFFYCNTSKLFNSTYNNNTNSNTITLPCRILKQIINMWQGVGQAMYAPPIA
 GNITCKSNITGLLLTRDGGKENTTETFRPGGDMRDNRSELYKYKVVEIKPLGVAPTEAKRRVVEREKR
 AVGLGAVFLGLGAAGSTMGAASI TLTVAQARQLLSGIVQQSNLLRAIEAQQHMLQLTWGKIQQLQARVL
 AMERYLKDQQLLGIWCSGKLICTTAVPWNSSWSNKSLLDDIWNMTMWEWDREISNYTDTIYRLLEESQN
 QQEKNEQDLLALDSWENLWNWFDITNWLWYIKIFIMIVGGLIGLRIIFAVL SIVNRVRQGYSPLSFQTLT
 PNPRGPDRLRIIEEGEGEQDRDRSIRLVSGFLALAWDDLRSLCLFSYHRLRDFILIAARTVELLGRSSLR
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Fig. 6C

C.con.env (subtype C consensus env)

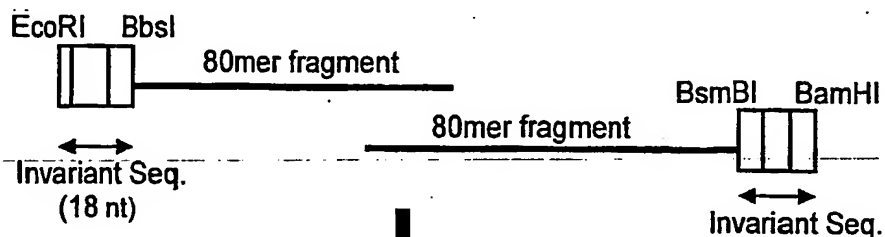
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 PAGYAILKCNKTFNGTGPCNNVSTVQCTHGIKPVVSTQLLNGSLAEEIIIRSENLTDNAKTIIVHLN
 ESVEIVCTRPNNNTRKSIRIGPGQTFYATGDIIGDIRQAHCNISEDKNKTLQRVSKKLEHFPNKTIKF
 EPSGGDLEITTHSFNCRGEFFYCNTSKLFNSTYNNNTNSNTITLPCRILKQIINMWQEVGRAMYAPPIA
 GNITCKSNITGLLLTRDGGKNTTEIFRPGGDMRDNRSELYKYKVVEIKPLGVAPTEAKRRVVEREKR
 AVGLGAVFLGLGAAGSTMGAASI TLTVAQARQLLSGIVQQSNLLRAIEAQQHMLQLTWGI KQLQTRVL
 ATERYLKDQQLLGIWCSGKLICTTAVPWNSSWSNKSQEDIWNMTMWDREISNYTDTIYRLLEDSQN
 QQEKNEKDLLALDSWKNLWNWFDITNWLWYIKIFIMIVGGLIGLRIIFAVLSIVNRVRQGYSPLSFQTLT
 PNPRGPDRLGRIIEEGEGEQDRDRSIRLVSGFLALAWDDLRSLCLFSYHRLRDFILVAARAVELLGRSSLR
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 LQ

Fig. 6D

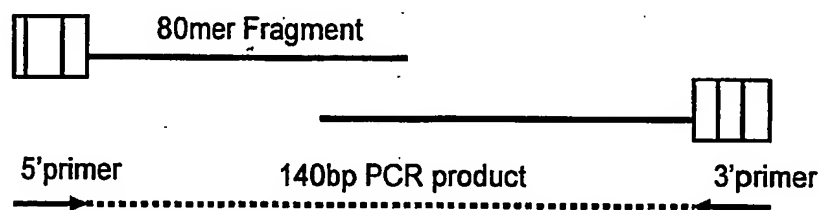
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Fig. 6E

Synthesize entire gene in 80-mer fragments overlapping by 20 residues at the 3' end with invariant sequences at the 5' end.

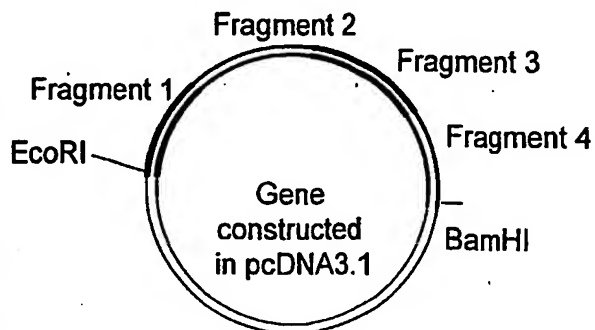


Paired 80mer oligos are connected via PCR in a stepwise manner from 5' to 3' using primers complimentary to the invariant seq.



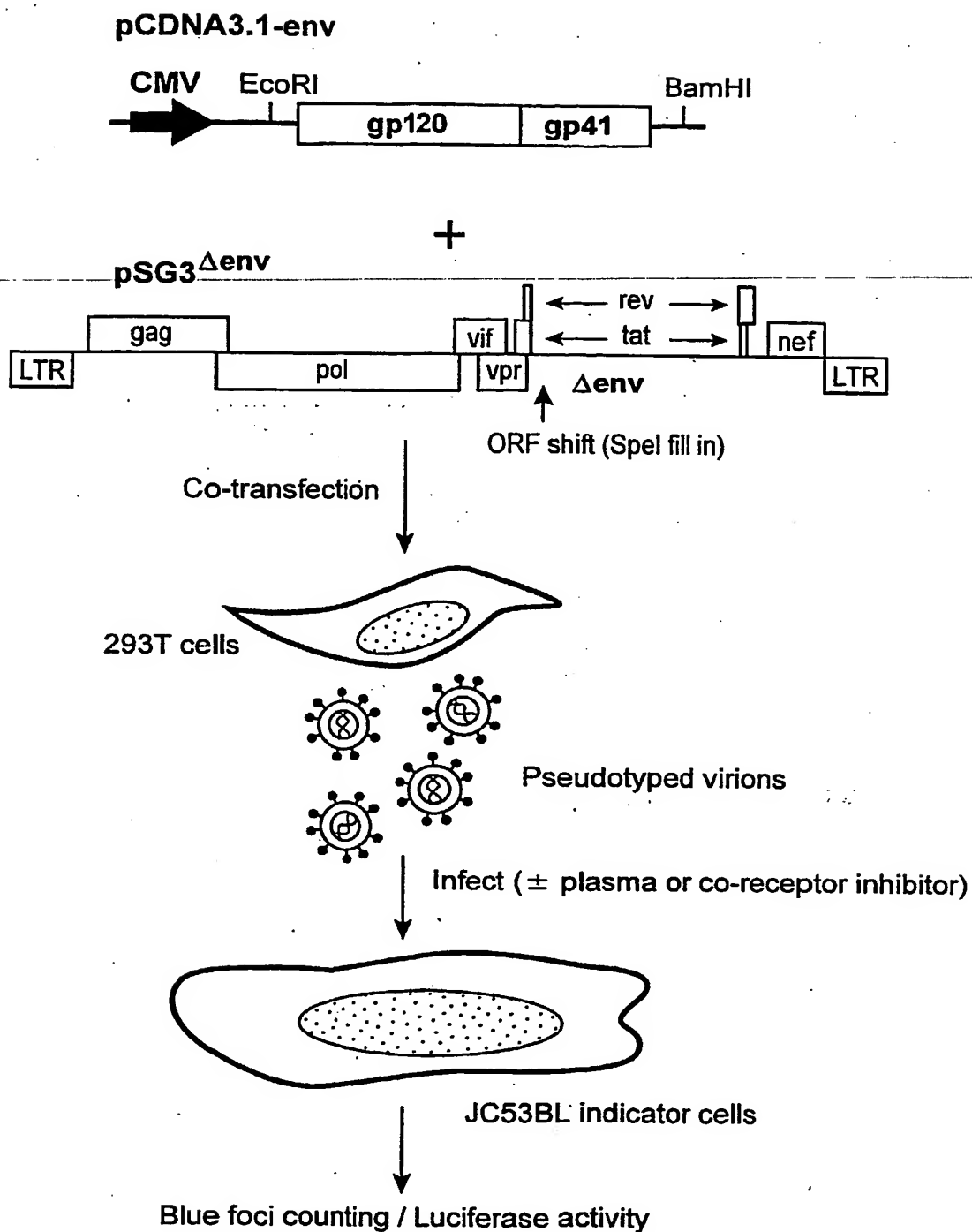
108bp PCR fragments cloned into pGEM-T and sequenced. Clones with the proper sequence will be cut with 2 restriction enzymes. 4 fragments will be ligated together with pcDNA3.1 in a stepwise manner from the 5' to 3' end of gene

Fragments to be ligated with pcDNA3.1 (1-4 are in order from 5' to 3')	Restriction Enzymes Used to Cleave Fragment
Fragment 1	EcoRI/BsmBI
Fragment 2	BbsI/BsmBI
Fragment 3	BbsI/BsmBI
Fragment 4	BbsI/BamHI
pcDNA3.1	EcoRI/BamHI



Ligations will be repeated stepwise 5' to 3' until the entire gene has been cloned into pcDNA3.1

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*Fig. 7*

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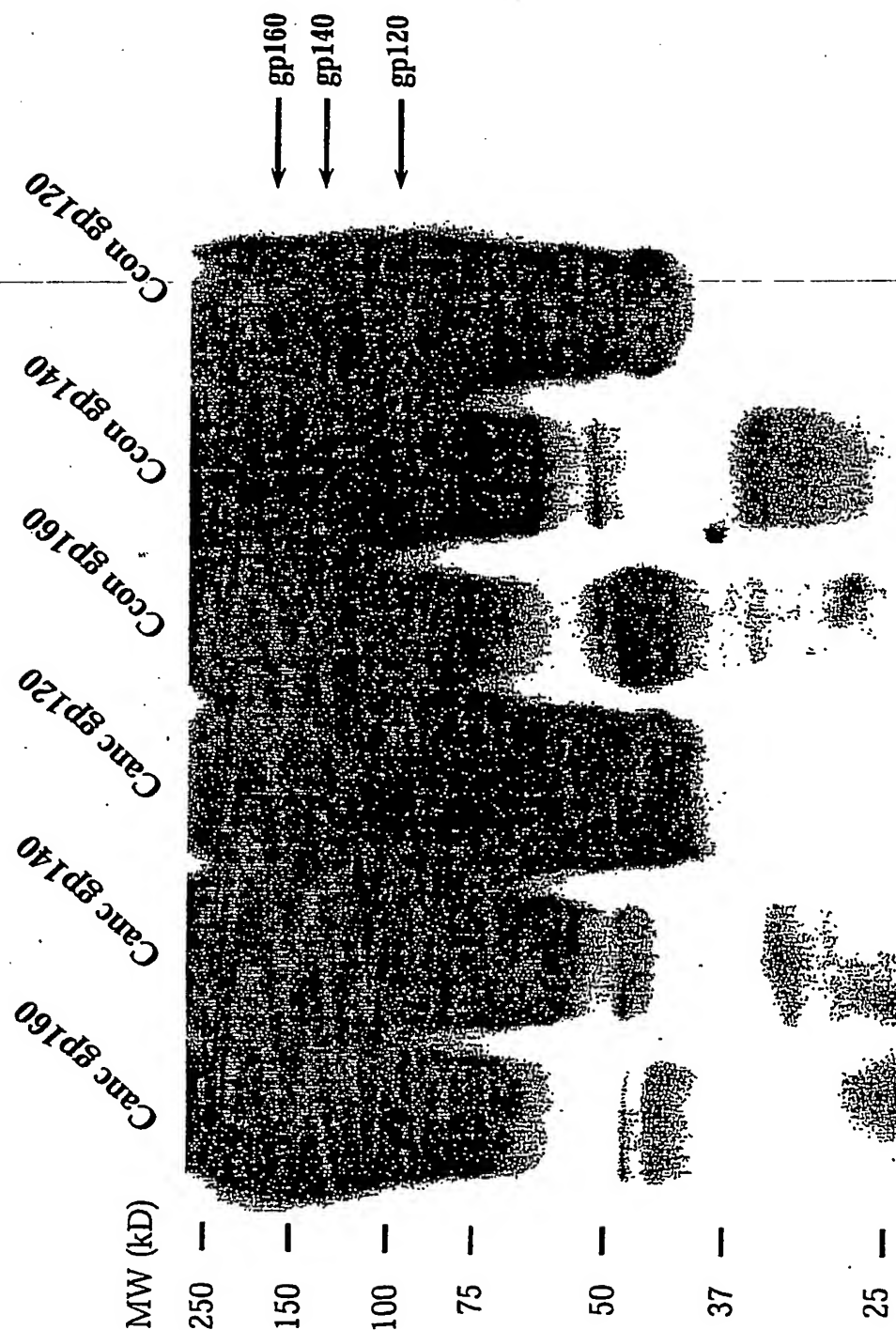
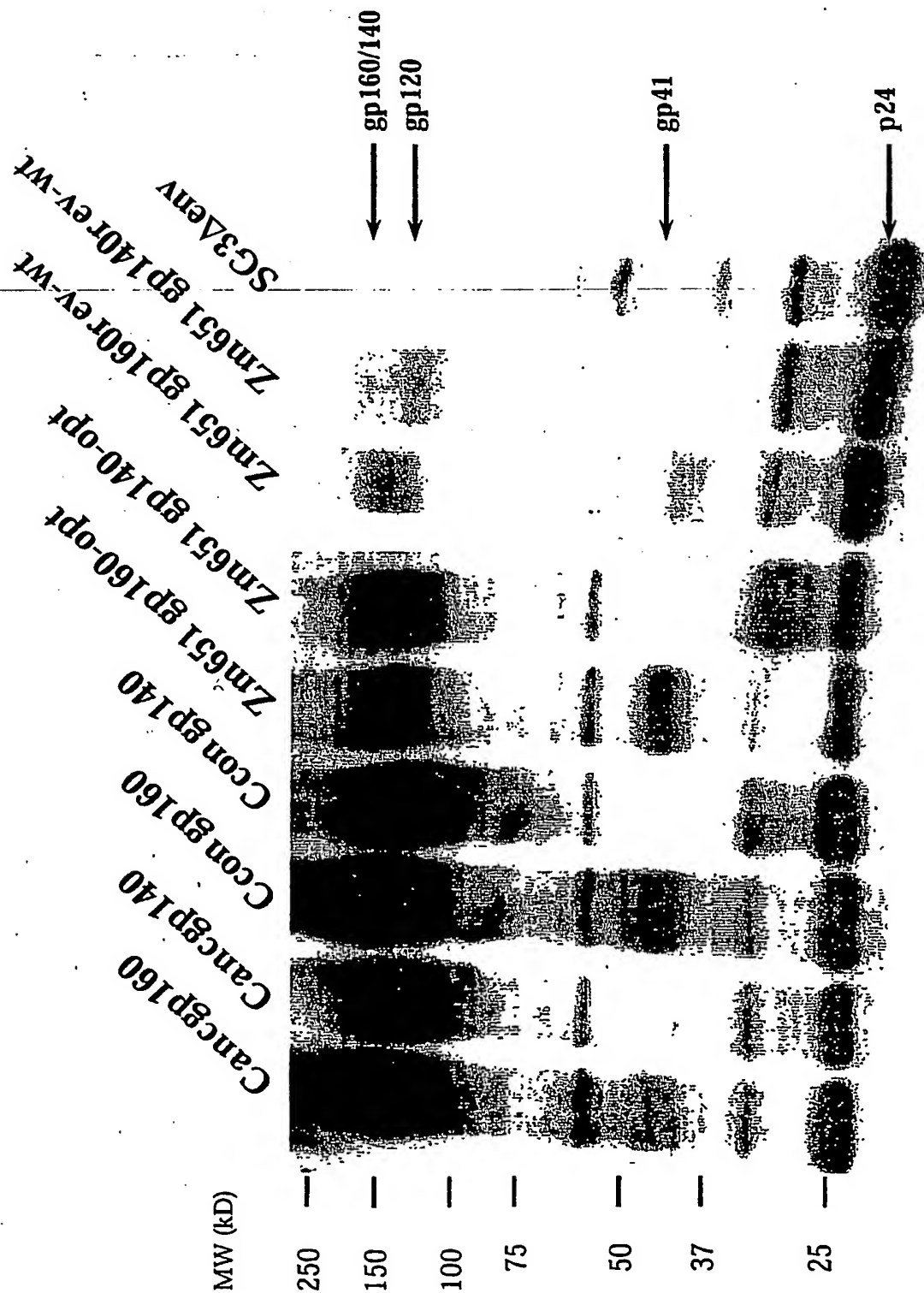


Fig. 9

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Fig. 10A



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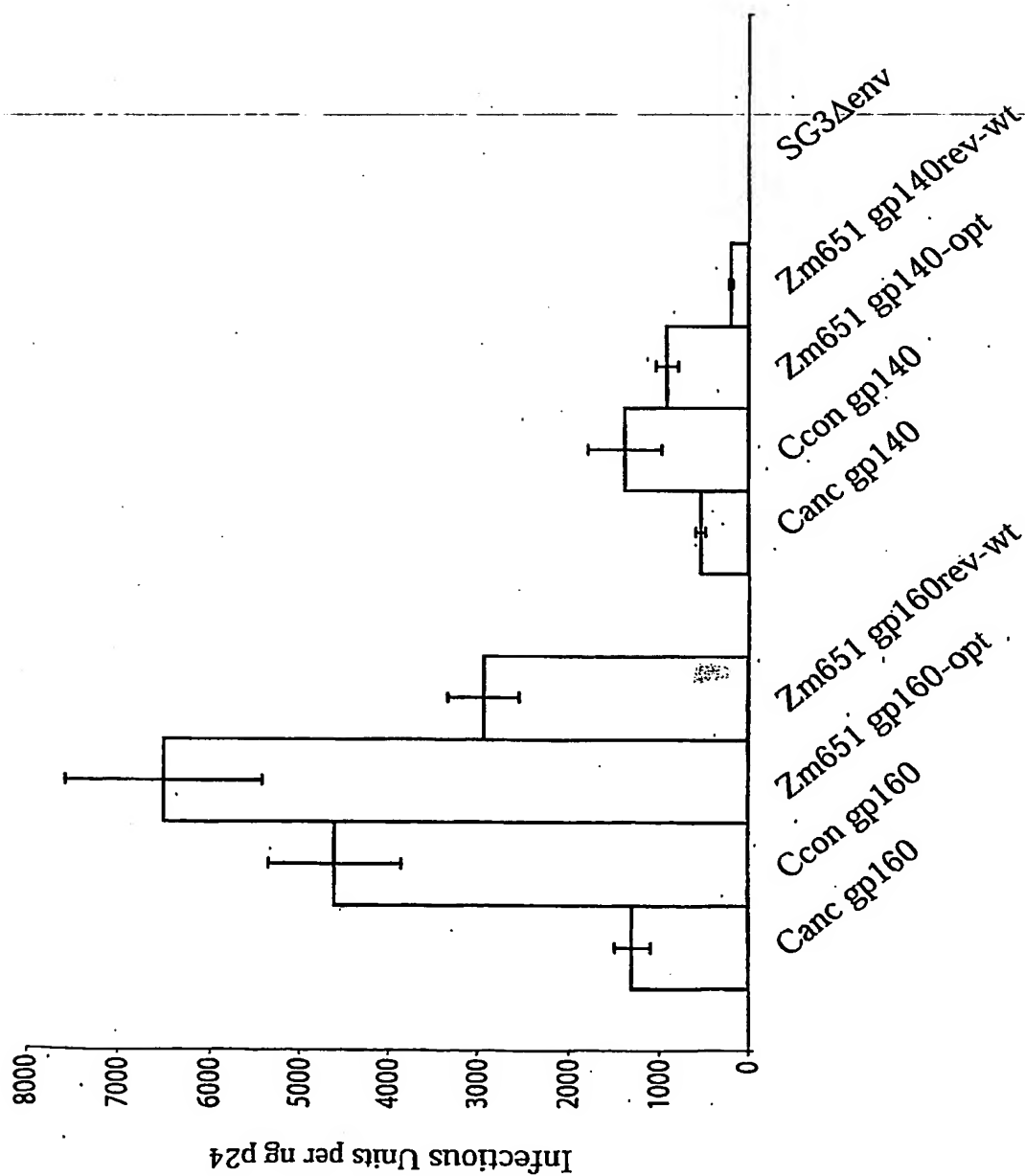
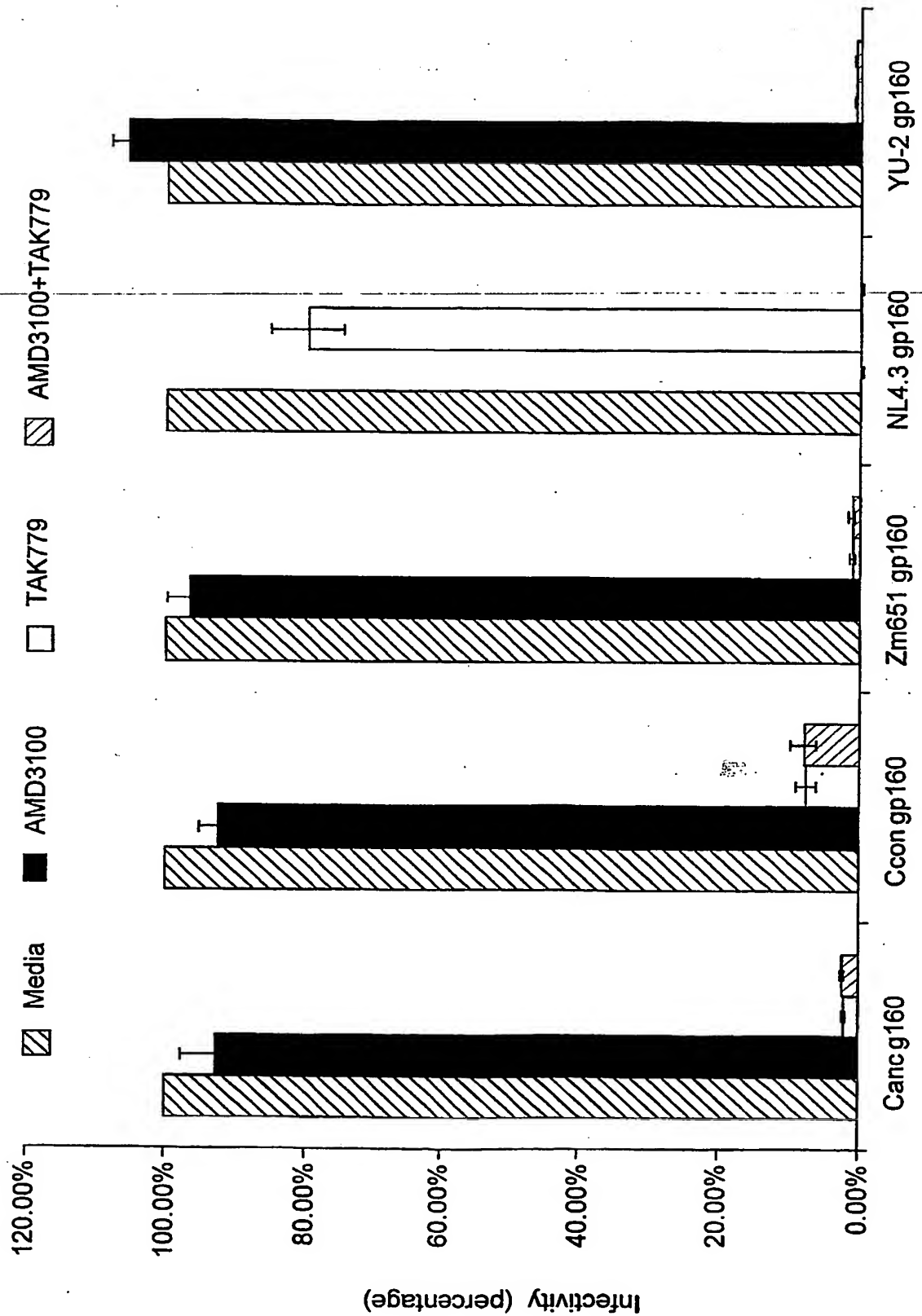


Fig. 10B

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Fig. 11



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Fig. 12A

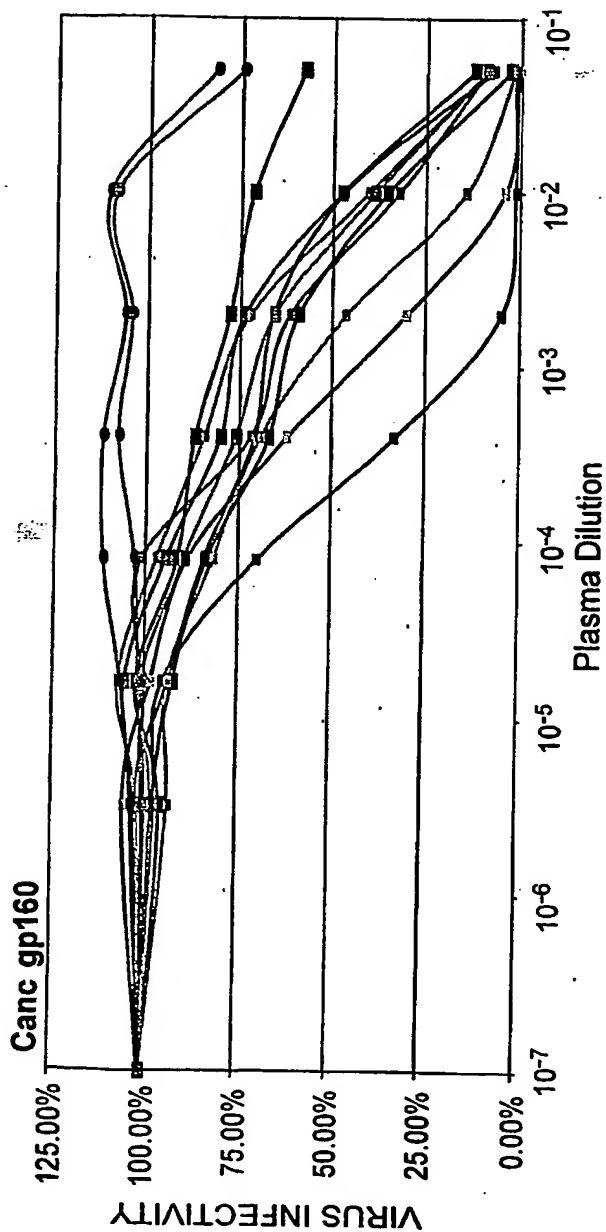
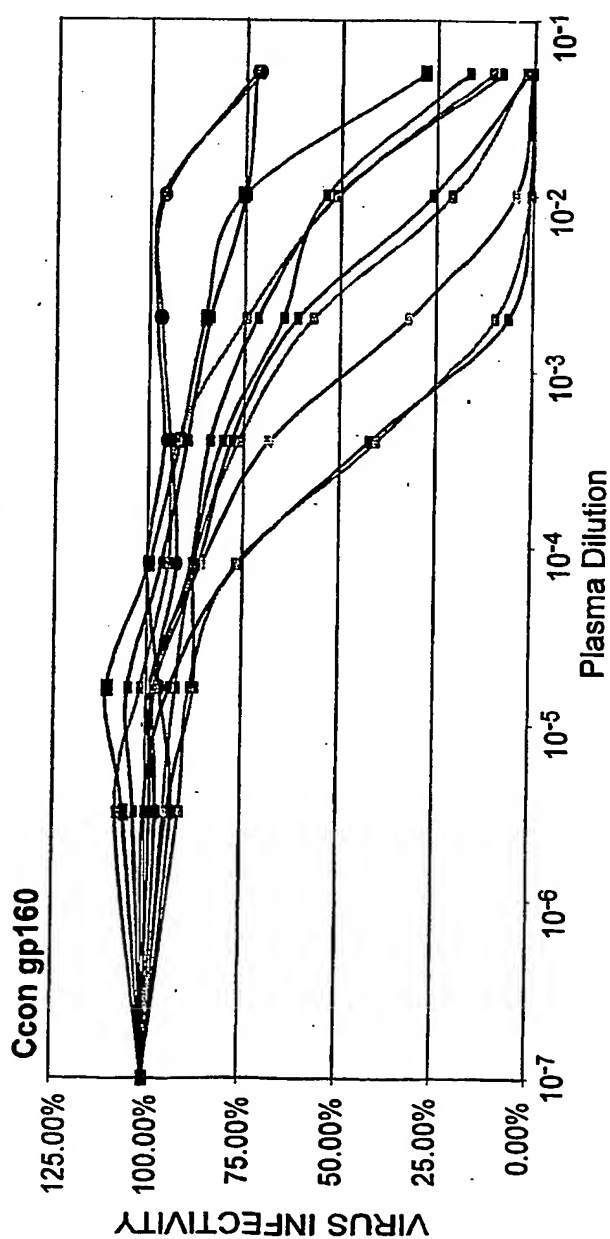


Fig. 12B



Plasma from HIV-1 subtype C infected patients

Plasma from uninfected donors

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Fig. 12C

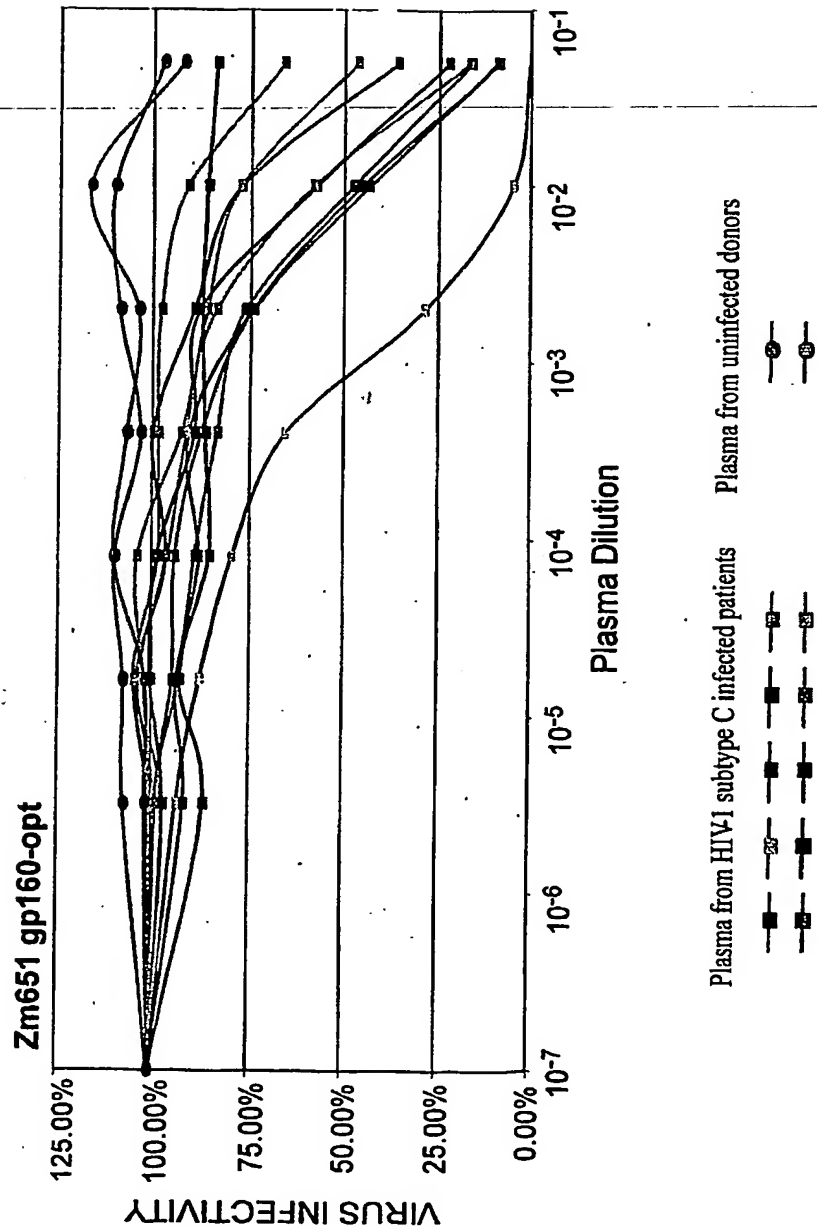


Fig. 13A Fig. 13B



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VQNLQGMVHQAI SPRTLNAWKVIEEKAFSPEVIMFTALSEGATPQDLNTMLNTVGGHQAAQMMLKDT
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RMYSFVSILDIKQGPKEPFDYVDRFFKTLRAEQATQDVKNWMTDILLVQANPDCKTILRALGPGASLE
EMMTACQGVGPGSHKARVLAEAMSOANNTNIMMORSNFKGPKRIVKCFNCGKEGHIARNCRAPRKKGCKW
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C.con.nef (subtype C consenus nef)
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GFPVPRPQVPLRPMTYKAAFDLSFFLKEKGLEGLIYSKKRQEILDLWVYHTQGFPPDWNQNYTPGPGVRY
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Fig. 13C

Fig. 13D

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C.con.gag (subtype C consensus gag. Not in the public domain)

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Fig. 13E

C.con.nef (subtype C consensus nef. Not in the public domain)

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 TCCTGAAGGAGAAGGGCGCTGGAGGGCTGATCTACAGCAAGAGCGCCAGGAGATCCTGGACCTGTG
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 CTGACCTTCGGCTGGTCTTCAAGCTGGTCCCGTGGACCCCGCGAGGTGGAGGAGGCCAACGAGGGCG
 AGAACAACTGCCTGTGACCCCCATGAGCCAGCACGGCATGGAGGACCGCGAGGTGCTGAAGTG
 GAAAGTTCAGACGCCACCTGGCCCCCGCCACATGGCCCCGCGAGCTGSCACCCCGAGTACTACAAGGACTGC
 TGA

Fig. 13F

CONs.env (gorup M consensus env gene. This one contain the consensus sequence for variable regions in env gene)

MRVIRGIQRNCQHLLWRWGTLILGMLMICSAAENLWVTYYGVVPVWKEANTTLFCASDAKAYDTEVHNV
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NNYTDIIYSLIEESONQOEKNEQELLALDKWASLWNWFDITNWLWYIKIFIMIVGGGLIGLRIVFAVLSIV
NRVRQYSPLSFQTLIPNPRGPDPRPEGIEEGEGEQDRDRSIRLVNGFLALAWDDLRLSLCLFSYHRLRDFI
LIAARTVELLGRKGLRGWEALKYLWNLLQYWQQLKNSAISLLDTTAAIAVAEGTDRVIEVVQACRAIL
NIPRRIRQGLERALL

Fig. 14A

CONS.gp160.1
CONS.gp160.2
CONS.gp160.3
CONS.gp160.4
CONS.gp160.5
CONS.gp160.6
CONS.gp160.7
CONS.gp160.8

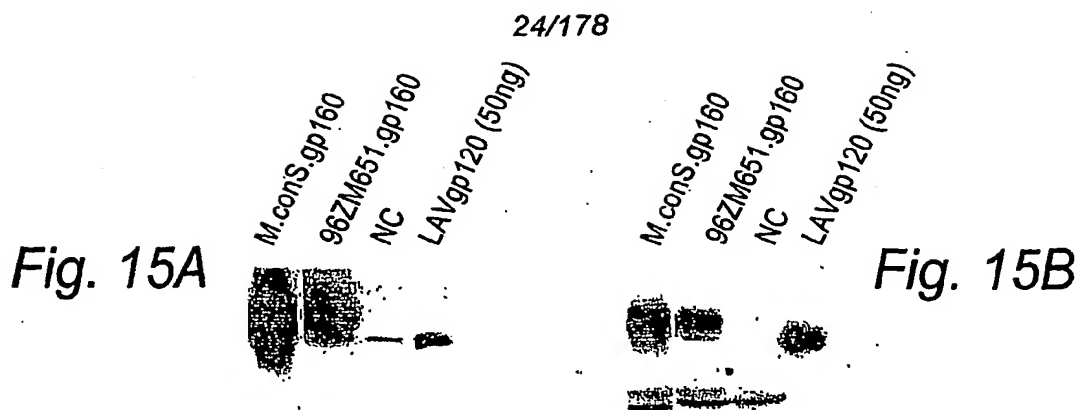
gp160

Fig. 14C

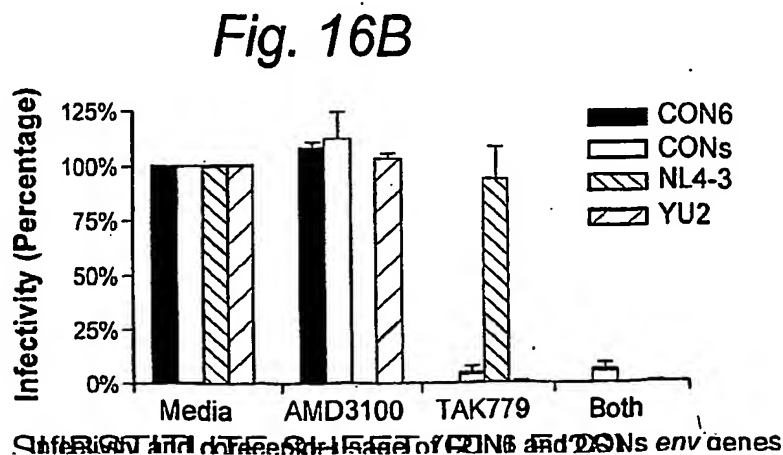
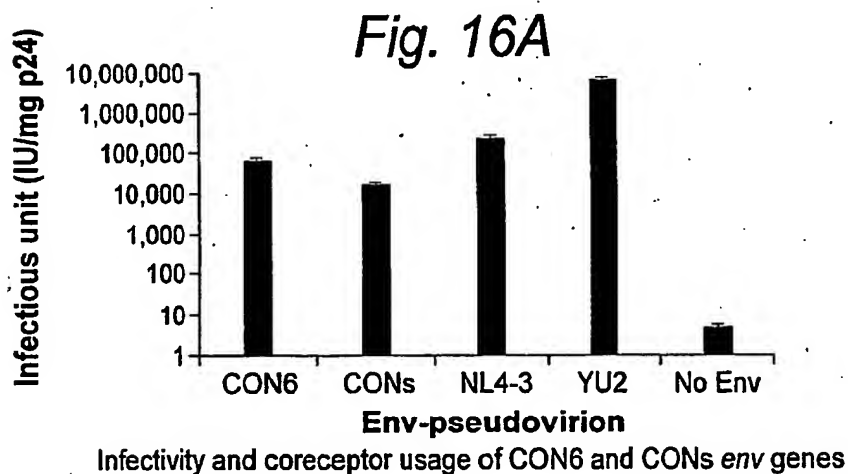
Fig. 14B

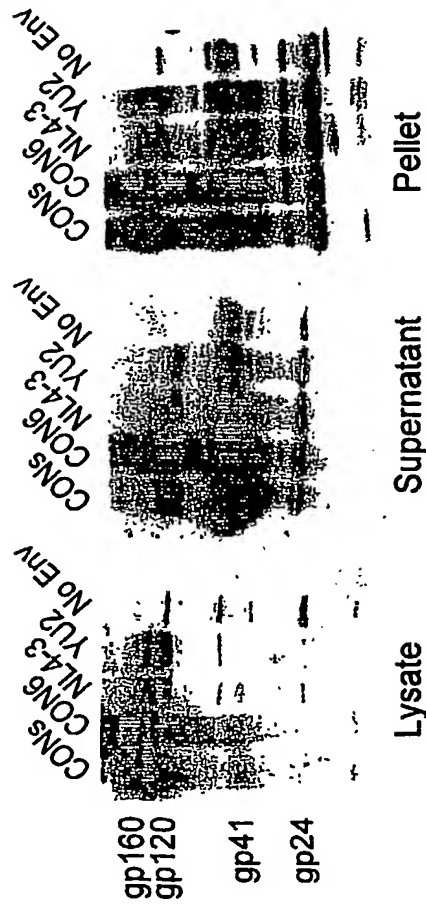
CONs.env (gorup M consensus env gene. This one contain the consensus sequence for variable regions in env gene. The identical amino acid sequences as in the public domain)

GCCGCCGCCATGCGCGTGCGCGGCATCCAGCGCAACTGCCAGCACCTGTG
GCGCTGGGGCACCCTGATCCTGGGCATGCTGATGATCTGCTCCGCCGCCG
AGAACCTGTGGGTGACCGTGTACTACGGCGTGCCCGTGTGGAAGGAGGCC
AACACCACCCTGTTCTGCGCCTCCGACGCCAAGGCCTACGACACCGAGGT
GCACAACGTGTGGGCCACCCACGCCTGCGTGCCACCGACCCCAACCCCC
AGGAGATCGTGCTGGAGAACGTGACCGAGAACTTCAACATGTGGAAGAAC
AACATGGTGGAGCAGATGCACGAGGACATCATCTCCCTGTGGGACCACTC
CCTGAAGCCCTGCGTGAAGCTGACCCCTGTGCGTGACCCCTGAACCTGCA
CCAACGTGAACGTGACCAACACCACCAACAACACCGAGGAGAAGGGCGAG
ATCAAGAACTGCTCCTTCAACATCACCACCGAGATCCGCGACAAGAAGCA
GAAGGTGTACGCCCTGTTCTACCGCCTGGACGTGGTGCCCATCGACGACA
ACAACAACAACCTCCTCCAACCTACCGCCTGATCAACTGCAACACCTCCGCC
ATCACCCAGGCCTGCCCAAGGTGTCTTCGAGCCCATCCCATCCACTA
CTGCGCCCCCGCCGGCTTCGCCATCCTGAAGTGCAACGACAAGAAGTTCA
ACGGCACC GGCCCCCTGCAAGAACGTGTCCACCGTGCAAGTGCAACCCACGGC
ATCAAGCCCGTGGTGTCCACCCAGCTGTGCTGAACGGCTCCCTGGCCGA
GGAGGAGATCATCATCCGCTCCGAGAACATCACCACAACGCCAAGACCA
TCATCGTGACGCTGAACGAGTCCGTGGAGATCAACTGCACCCGCCCAAC
AACAACACCCGCAAGTCCATCCGCATCGGCCCGGCCAGGCCTTCTACGC
CACCGGCGACATCATCGGCGACATCCGCCAGGCCCACTGCAACATCTCCG
GCACCAAGTGAACAAGACCCTGCAGCAGGTGGCCAAGAAGCTGCGCGAG
CACTTCAACAACAAGACCATCATCTTCAAGCCCTCCTCCGGCGGGCAGCCT
GGAGATCACCAACCACTCCTTCAACTGCCGCGGGCAGTTCTTCTACTGCA
ACACCTCCGGCCTGTTCAACTCCACCTGGATCGGCAACGGCACCAAGAAC
AACAACAACACCAACGACACCATCACCTGCCCTGCCGCATCAAGCAGAT
CATCAACATGTGGCAGGGCGTGGGCCAGGCATGTACGCCCCCCCCATCG
AGGGCAAGATCACCTGCAAGTCCAACATCACCGGCCTGCTGTGACCCGC
GACGGCGGCAACAACAACACCAACGAGACCGAGATCTTCCGCCCGGCCG
CGGCGACATGCGCGACAACCTGGCGCTCCGAGCTGTACAAGTACAAGGTGG
TGAAGATCGAGCCCCCTGGGCGTGGCCCCACCAAGGCCAAGCGCCGCTG
GTGGAGCGCGAGAAGCGCGCCGTGGGCATCGGCGCCGTGTTCTGGGCTT
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TGCAGGCCCGCCAGCTGCTGTCCGGCATCGTGACGAGCAGTCCAACCTG
CTGCCGCCATCGAGGCCAGCAGCACCTGCTGCAGCTGACCGTGTGGGG
CATCAAGCAGCTGCAGGCCCGGTGCTGGCCGTGGAGCGCTACCTGAAGG
ACCAGCAGCTGCTGGGCATCTGGGGCTGCTCCGGCAAGCTGATCTGCACC
ACCACCGTGCCCTGGAACCTCCTCCTGGTCCAACAAGTCCCAGGACGAGAT
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CCGACATCATCTACTCCCTGATCGAGGAGTCCCAGAACGAGCAGGAGAAG
AACGAGCAGGAGCTGCTGGCCCTGGACAAGTGGGCCTCCCTGTGGAACCTG
GTTTCGACATCACCAACTGGCTGTGGTACATCAAGATCTTCATCATGATCG
TGGGCGGCCTGATCGGCCTGCGCATCGTGTTCGCCGTGCTGTCCATCGTG
AACC GCGTGCGCCAGGGCTACTCCCCCTGTCCTTCCAGACCCCTGATCCC
CAACCCCCCGGCCCGGACCGCCCCGAGGGCATCGAGGAGGAGGGCGGCG
AGCAGGACCGCGACCGCTCCATCCGCTGGTGAACGGCTTCTCTGGCCCTG
GCCTGGGACGACCTGCGCTCCCTGTGCTGCTTCTCCTACCACCGCTGCG
CGACTTCATCCTGATCGCCGCCCGCACCGTGGAGCTGCTGGGCGGCAAGG
GCCTGCGCCCGGCTGGGAGGCCCTGAAGTACCTGTGGAACCTGCTGCAG
TACTGGGGCCAGGAGCTGAAGAACTCCGCCATCTCCCTGCTGGACACCAC
CGCCATCGCCGTGGCCGAGGGCACCGACCGCTGATCGAGGTGGTGCAGC
GCGCCTGCGCGCCATCCTGAACATCCCCCGCCGCATCCGCCAGGGCCTG
GAGCGCGCCTGCTGTTA



Cell lysate Supernatant
Expression of A.con env gene in mammalian cells





Env protein incorporation in CON6 and CONs Env-pseudovirions

Fig. 17A Fig. 17B Fig. 17C

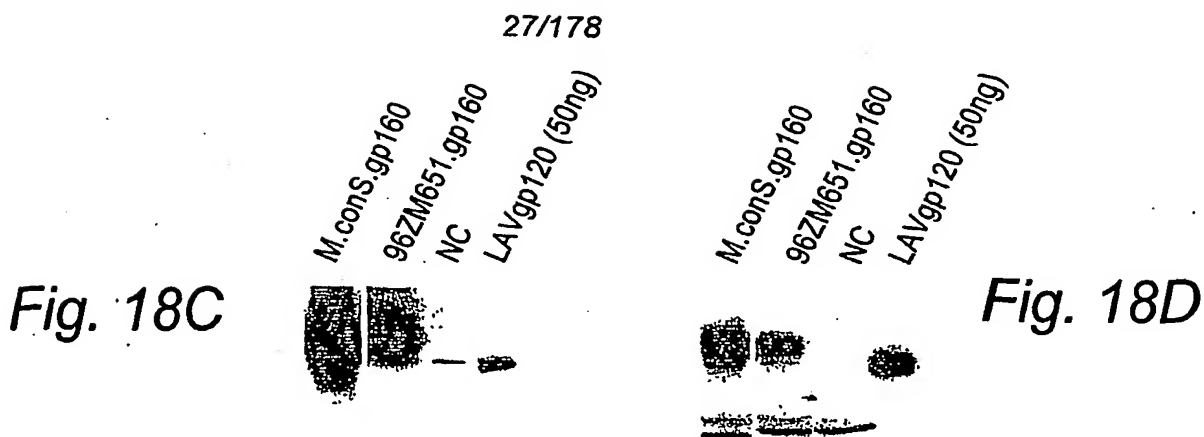
A.con.env (subtype A consensus env)

MRVMGIQRNCQHLWRWGTMIIGMIIICSAEENLWTVVYGVVWKAETTLFCASDAKAYDTEVHNV
WATHACVPTDPNPQEIENLENTVEEFNMWKNMVEQMHTDIIISLWDQSLKPCVKLTPLCVTLNCSNVNVT
NITNITDNMKEIKNCSEFNMVTELRDCKQKVSLFYKLDVVQINKSNSSSQYRLINCNSTAITOACPKVS
FEPITHYCAPAGFAILKCKDKEFNGTGPCKNVSTVQCTHGIKPVWSTQLLNGSLAESEVMIRSENITN
NAKNIIVQLTKPVKINCTRPNNNTRKSIIRIGPGQAFYATGDIIGDIRQAHCVNSRTEWNETLQKVAQRLR
KYFNKTIIFTNSSGGDLIITHSFNCGGEFFYCNTSGLFNSTWNGTKKKNSTESNDITLPCRIKQI
INWQRVGQAMYAPPIQGVRICESNITGLLLTRDGGDNNSKNETFRPGGDMRDNRSELYKYKVVKIEP
LGVAPTKAKRRVVEREKRAVGIGAVFLGFLGAAGSTMGAAISITLVQARQLLSGIVQQQSNLLRAIEAQQ
HLLKLTWGIKQLQARVLAVERYLKDQQLLGIWGCGLICTTNVPWNSSWSNKSQSEIWDNMTWLQWDK
EISNYTDIIYNLIEESQOQEKNEODLLALDKWANLW NWFEDISNLWYIKIFIMIVGGLIGLRIVFAVLS
VINRVROGYSPLSFQHTPNPGGLDRPGRIIEEGEGQGRDRSIRLVSGFLALAWDDLRLSLCLFSYHRLRD
FILIAARTVELLGHSSSLKGLRLGWEGLYLWNLNLLYWGRELKISAINLLDTIAIAGWTDVRVIEIGQRI
CRAILNIPRRIRQGLERALL

Fig. 18A

Fig. 18B

CCGCGCCGCATGCGCGTGTATGGGCATTCAGCGCAACTGCCAGCACCTGTG
GCGCTGGGGCACCATGATCCTGGGCATGATCATCATCTGCTCCGCCGCCG
AGAACCTGTGGGTGACCGTGTACTACGGCGTGCCCGTGTGGAAGGACGCC
GAGACCACCCTGTTCTGCGCCTCCGACGCCAAGGCCTACGACACCGAGGT
GCACAACGTGTGGGCCACCCACGCCTGCGTGCCACCGACCCCAACCCCC
AGGAGATCAACCTGGAGAACGTGACCGAGGAGTTCAACATGTGGAAGAAC
AACATGGTGGAGCAGATGCACACCGACATCATCTCCCTGTGGGACCAGTC
CCTGAAGCCCTGCGTGAAGCTGACCCCTGTGCGTGACCTGAACTGCT
CCAACGTGAACGTGACCACCAACATCACCAACATCACCGACAACATGAAG
GGCGAGATCAAGAACTGCTCCTTCAACATGACCACCGAGCTGCGCGACA
GAAGCAGAAGGTGTACTCCCTGTTCTACAAGCTGGACGTGGTGCAGATCA
ACAAGTCCAACCTCCTCCTCCAGTACCGCCTGATCAACTGCAACACCTCC
GCCATCACCCAGGCCTGCCCCAAGGTGTCTTCGAGGCCCATCCCCATCCA
CTACTGCGCCCCCGCCGGCTTCGCCATCCTGAAAGTGCAAGGACAAGGAGT
TCAACGGCACC GGCCCCCTGCAAGAACGTGTCCACCGTGCACTGCACCCAC
GGCATCAAGCCCGTGGTGTCCACCCAGCTGTCTGTAACGGCTCCTTGGC
CGAGGAGGAGGTGATGATCCGCTCCGAGAACATCACCAACACGCCAAGA
ACATCATCGTGCAGCTGACCAAGCCCGTGAAGATCAACTGCACCCGCCCC
AACAAACAACCCCGCAAGTCCATCCGCATCGGCCCGGCCAGGCCTTCTA
CGCCACCGGCGACATCATCGGCGACATCCGCCAGGCCCACTGCAACGTGT
CCCGCACCGAGTGGAACGAGACCCTGCAGAAGGTGGCCAAGCAGCTGCGC
AAGTACTTCAACAACAAGACCATCATCTTCACCAACTCCTCCGGCGGCGA
CCTGGAGATCACCAACCCATCCTTCAACTGCGGCGGCGAGTTCTTCTACT
GCAACACCTCCGGCTGTTCTCAACTCCACCTGGAACGGCAACGGCACCAG
AAGAAGAACTCCACCGAGTCCACAGCAACCATCACCCGTGCCCTGCGCAT
CAAGCAGATCATCAACATGTGGCAGCGCGTGGGCGCAGGCCATGTACGCC
CCCCCATCCAGGGCGTGATCCGCTGCGAGTCCAACATCACCGGCCTGCTG
CTGACCCGCGACGGCGGC GACAACAACCTCAAGAACGAGACCTTCCGCC
CGGCGGCGGCGACATGCGCGACAACCTGGCGCTCCGAGCTGTACAAGTACA
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CGCGTGGTGGAGCGCGAGAAGCGCGCCGTGGGCATCGGCGCCGTGTTCT
GGGCTTCTGGGGCGCCGCGGCTCCACCATGGGCGCGCTCCATCACCC
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AACCTGCTGCGCGCCATCGAGGCCAGCAGACCTGCTGAAGCTGACCGT
GTGGGGCATCAAGCAGCTGCAGGCCCGCGTGTGGCCGTGGAGCGCTACC
TGAAGGACCAGCAGCTGCTGGGCATCTGGGGCTGCTCCGGCAAGCTGATC
TGCACCACCAACGTGCCCTGGAACCTCCTCCTGGTCCAACAAGTCCCAGTC
CGAGATCTGGGACAACATGA CCTGGCTGCAGTGGGACAAGGAGATCTCCA
ACTACACCGACATCATCTACAACCTGATCGAGGAGTCCCAGAACCAGCAG
GAGAAGAACGAGCAGGACCTGCTGGCCCTGGACAAGTGGGCCAACCTGTG
GAATGGTTCGACATCTCAACTGGCTGTGGTACATCAAGATCTTTCATCA
TGATCGTGGGCGGCTGATCGGCCTGCGCATCGTGTTCGCGCTGCTGTC
GTGATCAACCGCGTGCGCCAG GGCTACTCCCCCTGTCTCTCCAGACCCA
CACCCCCAACCCCGGCGGCTGGACCGCCCCGGCCGCATCGAGGAGGAGG
GCGGCGAGCAGGGCCGCGACCGCTCCATCCGCCTGGTGTCCGGCTTCTTG
GCCCTGGCCTGGGACGACCTGCGCTCCTGTGCTGTTCTCCTACCACCG
CCTGCGCGACTTCATCCTGATCGCCGCCCGCACCGTGGAGCTGCTGGGCC
ACTCCTCCTGAAGGGCCTGCG CTTGGGCTGGGAGGGCCTGAAGTACCTG
TGAACCTGCTGTGTACTGGGGCCGCGAGCTGAAGATCTCCGCCATCAA
CCTGTGGACACCATCGCCATCGCCGTGGCCGGCTGACCGACCGCGTGA
TCGAGATCGGCCAGCGCATCTGCCGCGCCATCCTGAACATCCCCCGCGC
ATCCGCGCAGGCTGAGCGCGCTGCTGAA E26)



Cell lysate

Supernatant

Expression of A.con env gene in mammalian cells

Fig. 19A

M.con.gag (group M consensus gag. Identical amino acid sequence to that in the public domain)

GCCGCCGCCATGGGCGCCCGCGCCTCCGTGCTGTCCGGCGGCAAGCTGGA
CGCCTGGGAGAAGATCCGCCTGCGCCCCGGCGGCAAGAAGAAGTACCGCC
TGAAGCACCTGGTGTGGGCCTCCCGCGAGCTGGAGCGCTTCGCCCTGAAC
CCCGGCCTGCTGGAGACCTCCGAGGGCTGCAAGCAGATCATCGGCCAGCT
GCAGCCCGCCCTGCAGACCGGCTCCGAGGAGCTGCGCTCCCTGTACAACA
CCGTGGCCACCCTGTACTGCGTGCAACCAGCGCATCGAGGTGAAGGACACC
AAGGAGGCCCTGGAGAAGATCGAGGAGGAGCAGAACAAGTCCCAGCAGAA
GACCCAGCAGGCCGCGCCGACAAGGGCAACTCCTCCAAGGTGTCCAGAA
ACTACCCCATCGTGCAAACTGCAAGGCCAGATGGTGCACCAGGCCATC
TCCCCCGCACCTGAACGCCTGGGTGAAGGTGATCGAGGAGAAGGCCTT
CTCCCCCGAGGTGATCCCCATGTTCTCCGCCCTGTCCGAGGGCGCCACCC
CCCAGGACCTGAACACCATGCTGAACACCGTGGGCGGCCACCAGGCCGCC
ATGCAGATGCTGAAGGACACCATCAACGAGGAGGCCGCCGAGTGGGACCG
CCTGCACCCCGTGCACGCCGCCCCATCCCCCGGCCAGATGCGCGAGC
CCCGCGGCTCCGACATCGCCGGCACCACCTCCACCTGCAAGGAGCAGATC
GCCTGGATGACCTCCAACCCCCCATCCCCGTGGGCGAGATCTACAAGCG
CTGGATCATCCTGGGCCTGAACAAGATCGTGCGCATGTACTCCCCCGTGT
CCATCCTGGACATCCGCCAGGGCCCCAAGGAGCCCTTCCGCGACTACGTG
GACCGCTTCTTCAAGACCTGCGCGCCGAGCAGGCCACCCAGGACGTGAA
GAACTGGATGACCGACACCCTGCTGGTGCAGAACGCCAACCCCGACTGCA
AGACCATCCTGAAGGCCCTGGGCCCCCGCGCCACCCTGGAGGAGATGATG
ACCGCCTGCCAGGCGTGGGCGGCCCGGCCACAAGGCCCGCGTGTGCGC
CGAGGCCATGTCCCAGGTGACCAACGCCGCCATCATGATGCAGCGCGCA
ACTTCAAGGGCCAGCGCCGCATCATCAAGTGCTTCAACTGCGGCAAGGAG
GGCCACATCGCCCGCAACTGCCGCGCCCCCGCAAGAAGGGCTGCTGGAA
GTGCGGCAAGGAGGGCCACCAGATGAAGGACTGCACCGAGCGCCAGGCCA
ACTTCCTGGGCAAGATCTGGCCCTCCAACAAGGGCCGCCCGGCAACTTC
CTGCAGTCCCGCCCCGAGCCACCGCCCCCCCCGCGGAGTCTTTCGGCTT
CGGCGAGGAGATCACCCCTCCCCCAAGCAGGAGCCCAAGGACAAGGAGC
CCCCCTGACCTCCCTGAAGTCCCTGTTCCGCAACGACCCCTGTCCCAG
TGA

M.con.pol.nuc

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Fig. 19B

GCCGCCGCATGCCCCAGATCACCTGTGGCAGCGCCCCCTGGTGACCAT
CAAGATCGGCGGCCAGCTGAAGGAGGCCCTGCTGGCCACCGCGCCGACG
ACACCGTGCTGGAGGAGATCAACCTGCCCGGCAAGTGGAAGCCCAAGATG
ATCGGCGGCATCGGCGGCTTCATCAAGGTGCGCCAGTACGACCAGATCCT
GATCGAGATCTGCGGCAAGAAGGCCATCGGCACCGTGCTGGTGGGCCCCA
CCCCCGTGAACATCATCGGCCGCAACATGCTGACCCAGATCGGCTGCACC
CTGAACCTCCCCATCTCCCCATCGAGACCGTGCCCGTGAAGCTGAAGCC
CGGCATGGACGGCCCCAAGGTGAAGCAGTGGCCCCCTGACCGAGGAGAAGA
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GAAGAAGGACTCCACCAAGTGGCGCAAGCTGGTGGACTTCCGCGAGCTGA
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CCATCCCCTCCATCAACAAGAGACCCCCGGCATCCGCTACCAGTACAAC
GTGCTGCCCCAGGGCTGGAAGGGCTCCCCGCCATCTTCCAGTCTCTCAT
GACCAAGATCTGTGGAGCCCTTCCGCACCCAGAACCCGAGATCGTGATCT
ACCAGTACATGGACGACCTGTACGTGGGCTCCGACCTGGAGATCGGCCAG
CACCGCGCCAAGATCGAGGAGCTGCGCGAGCACCTGCTGCGCTGGGGCTT
CACCAACCCCGACAAGAAGCACCAAGAAGGAGCCCCCTTCTGTGGATGG
GCTACGAGCTGCACCCCGACAAGTGGACCGTGACGCCATCCAGCTGCC
GAGAAGGACTCCTGGACCGTGAACGACATCCAGAAGCTGGTGGGCAAGCT
GAACTGGGCCTCCAGATCTACCCCGGCATCAAGGTGAAGCAGCTGTGCA
AGCTGCTGCGCGGCGCCAAGGCCCTGAACCGACATCGTGCCCTGACCGAG
GAGGCCGAGCTGGAGCTGGCCGAGAACCGCGAGATCCTGAAGGAGCCCGT
GCACGGCGTGTACTACGACCCCTCCAAGGACCTGATCGCCGAGATCCAGA
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AACCTCAAGACCGGCAAGTACGCCAAGATGCGCTCCGCCCACACCAACGA
CGTGAAGCAGCTGACCGAGGCCGTGCAGAAGATCGCCACCGAGTCCATCG
TGATCTGGGGCAAGACCCCCAAGTTCCGCCTGCCCATCCAGAAGGAGACC
TGGGAGACCTGGTGGACCGAGTACTGGCAGGCCACCTGGATTCCCGAGTG
GGAGTTCTGTGAACACCCCCCCCCCTGGTGAAGCTGTGGTACCAGCTGGAGA
AGGAGCCCATCGCCGGCGCCGAGACCTTCTACGTGGACGGCGCCGCCAAC
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GAAGGTGGTGTCCCTGACCGAGACCACCAACCAGAAAACGAGCTGCAGG
CCATCCACCTGGCCCTGCAGGACTCCGGCTCCGAGGTGAACATCGTGACC
GACTCCCAGTACGCCCTGGGCATCATCCAGGCCAGCCCCGACAAGTCCGA
GTCCGAGCTGGTGAACCAGATCATCGAGCAGCTGATCAAGAAGGAGAAGG
TGTAACCTGTCTTGGGTGCCCGCCACAAGGGCATCGGCGGCAACGAGCAG
GTGGACAAGCTGGTGTCCACCGGCATCCGCAAGGTGCTGTTCTTGACGG
CATCGACAAGGCCAGGAGGAGCAGAGAAGTACCACTCCAAGTGGCGCG
CCATGGCCCTCCGACTTCAACCTGCCCCCATCGTGGCCAAGGAGATCGTG
GCCTCCTGCGACAAGTGCCAGCTGAAGGGCGAGGCCATGCACGGCCAGGT
GGACTGCTCCCCCGGCATCTGGCAGCTGGACTGCACCCACCTGGAGGGCA
AGATCATCCTGGTGGCCGTGCACGTGGCCTCCGGCTACATCGAGGCCGAG
GTGATCCCCCGCCGAGACCGGCCAGGAGACCGCCTACTTCATCCTGAAGCT
GGCCGGCCGCTGGCCCGTGAAGGTGATCCACACCGACAACGGCTCCAAGT
TCACCTCCGCCCGCGTGAAGGCCGCCTGCTGGTGGGCGGCCATCCAGCAG
GAGTTCGGCATCCCCTACAACCCCCAGTCCCAGGGCGTGGTGGAGTCCAT
GAACAAGGAGCTGAAGAAGATCATCGGCCAGGTGCGCGACCAAGGCCGAGC
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AAGGGCGGCATCGGCGGCTACTCCGCCGGCGAGCGCATCATCGACATCAT
CGCCACCGACATCCAGACCAAGGAGCTGCAGAAGCAGATCACCAAGATCC
AGAACTTCCGCGTGTACTACCGGACTCCCGCGACCCCATCTGGAAGGGC
CCCGCCAAGCTGCTGTGGAAGGGCGAGGGCGCCGTGGTGTATCCAGGACAA
CTCCGACATCAAGGTGGTGGCCCGCCGCAAGGCCAAGATCATCCGCGACT
ACGGCAAGCAGATGGCCGGGACGACTGCGTGGCCGGCCCGCCAGGACGAG

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Fig. 19C

M.con.nef (group M consensus nef. Identical amino acid sequence to that in the public domain)

GCCGCCGCCATGGGCGGCAAGTGGTCCAAGTCCTCCATCGTGGGCTGGCC
CGCCGTGCGCGAGCGCATCCGCCGCACCACCCCGCCGCCGAGGGCGTGG
GCGCCGTGTC CAGGACCTGGACAAAGCA CGGCGCCATCACCTCCTCAAC
ACCGCCGCCAACCAACC CGACTGCGCCTGGCTGGAGGCCAGGAGAGGA
GGAGGAGGTGGGCTTC CCGTGC GC CCCAGGTGCCCTGCGCCCATGA
CCTACAAGGCCGCCCTGGACCTGTC CCACTTCCTGAAGGAGAAGGGCGGC
CTGGAGGGCCTGATCTACTCCAAGAAGCGCAGGAGATCCTGGACCTGTG
GGTGTAACCA CACCCAGGGCTACTTC CCGACTGGCAGAACTACACCCCG
GCCCCGGCATCCGCTA CCCCCTGACCTT CGGCTGGTGCTTCAAGCTGGTG
CCCGTGGACCCGAGGAGGTGGAGGAGGCCAACGAGGGCGAGAACAACCTC
CCTGCTGCACCCCATGTGCCAGCACGGCATGGAGGACGAGGAGCGCGAGG
TGCTGATGTGGAAGTTCGACTCCCGCCTGGCCCTGCGCCACATCGCCGC
GAGCTGCACC CGAGTACTACAAGGACTGCTAA

Fig. 19D

C.con.pol.nuc

GCCGCCGCCATGCCCCAGATCACCTGTGGCAGCGCCCCCTGGTGTCCAT
CAAGGTGGGCGGCCAGATCAAGGAGGCCCTGCTGGCCACCGGCGCCGACG
ACACCGTGCTGGAGGAGATCAACCTGCCCGGCAAGTGGAAGCCCAAGATG
ATCGGCGGCATCGGCGGCTTCATCAAGGTGCGCCAGTACGACCAGATCCT
GATCGAGATCTGCGGCAAGAAGGCCATCGGCACCGTGCTGGTGGGCCCCA
CCCCCGTGAACATCATCGGCCGAACATGCTGACCCAGCTGGGCTGCACC
CTGAACCTCCCCATCTCCCCATCGAGACCGTGCCCGTGAAGCTGAAGCC
CGGCATGGACGGCCCCAAGGTGAAGCAGTGGCCCCTGACCGAGGAGAAGA
TCAAGGCCCTGACCGCCATCTGCGAGGAGATGGAGAAGGAGGGCAAGATC
ACCAAGATCGGCCCCGAGAACCCCTACAACACCCCCGTGTTCCGCCATCAA
GAAGAAGGACTCCACCAAGTGGCGCAAGCTGGTGGACTTCCGCGAGCTGA
ACAAGCGCACCCAGGACTTCTGGGAGGTGCAGCTGGGCATCCCCACCCC
GCCGGCCTGAAGAAGAAGAAGTCCGTGACCGTGCTGGACGTGGGCGACGC
CTACTTCTCCGTGCCCTGGACGAGGGCTTCCGCAAGTACACCGCCTTCA
CCATCCCCCTCATCAACAACGASACCCCCGGCATCCGCTACCAGTACAAC
GTGCTGCCCCAGGGCTGGAAGGGCTCCCCCGCCATCTTCCAGTCCCTCAT
GACCAAGATCCTGGAGCCCTTCCGCGCC CAGAACCCCGAGATCGTGATCT
ACCAGTACATGGACGACCTGTACGTGGGCTCCGACCTGGAGATCGGCCAG
CACCGCGCCAAGATCGAGGAGCTGCGCGAGCACCTGCTGAAGTGGGGCTT
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GAGAAGGACTCCTGGACCGTGAACGACATCCAGAAGCTGGTGGGCAAGCT
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AGCTGTGTCGCGGCGCCCAAGGCCCTGACCGACATCGTGCCCTGACCGAG
GAGGCCGAGCTGGAGCTGGCCGAGAACC GCGAGATCCTGAAGGAGCCCGT
GCACGGCGTGTA CTACGACCCCTCCAAGGACCTGATCGCCGAGATCCAGA
AGCAGGGCCACGACCAGTGGACCTACCAGATCTACCAGGAGCCCTTCAAG
AACCTCAAGACCGGCAAGTACGCCAAGATGCGCACCGCCCCACACCAACGA
CGTGAAGCAGCTGACCGAGGCCGTGCAGAAGATCGCCATGGAGTCCATCG
TGATCTGGGGCAAGACCCCCAAGTTCCGCTGCCCATCCAGAAGGAGACC
TGGGAGACCTGGTGGACCGACTACTGGCAGGCCACCTGGATTCCCCAGTG
GGAGTTCTGTAACACCCCCCCCCCTGGTGAAGCTGTGGTACCAGCTGGAGA
AGGAGCCCTGTCCTGTTGTCAGAACTTCTAGTTCAGGCGCCGCCAAC

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Fig. 19D (continued)

CGCGAGACCAAGATCGGCAAGGCCGGCTACGTGACCGACCGCGGCCGCCA
 GAAGATCGTGTCCCTGACCGAGACCAACCAACAGAAACCGAGCTGCAGG
 CCATCCAGCTGGCCCTGCAGGACTCCGGCTCCGAGGTGAACATCGTGACC
 GACTCCAGTACGCCCTGGGATCATCCAGGCCAGCCCGACAAGTCCGA
 GTCCGAGCTGGTGAACAGATCATCGAGCAGTGTCAAGAAGGAGCGCG
 TGTACTGTCTGGGTGCCGCCCAAGGGCATCGGCGGCAACGAGCAG
 GTGGACAAGCTGGTGTCTCCGGCATCCGAAGTGTCTTCTGGACGG
 CATCGACAAGGCCAGGAGGACGAGAAGTACCACTCCAACCTGGCGCG
 CCATGGCCTCCGAGTTCAACCTGCCCCCATCGTGGCCCAAGGAGATCGTG
 GCCTCTGCGACAAGTGCAGCTGAAGGGCGAGGCCATGACGGCCAGGT
 GGACTGCTCCCCCGGCATCTGGCAGCTGGACTGCACCCACCTGGAGGGCA
 AGATCATCTGTGGTGGCCGTGACGTGGCTCCGGCTACATCGAGGCCGAG
 GTGATCCCCCGGAGACCGGCCAGGAGACCGCTACTTCACTCCTGAAGCT
 GGCCGGCCGCTGGCCCGTGAAGCCGCTGTCGTGGTGGCCGCGATCCAGCAG
 TCACCTCCGCCCGCTGAAGCCGCTGTCGTGGTGGCCGCGATCCAGCAG
 GAGTTCGGCATCCCCTACAACCCAGTCCAGGGCGTGGTGGAGTCCAT
 GAACAAGGAGCTGAAGAAGATCATCGGCCAGGTGCGCGACCGAGCCGAGC
 ACCTCAAGACCGCCGTGCAGATGGCCGTGTTCACTCCACAACCTCAAGCGC
 AAGGGCGGCATCGCGCGTACTCCGCCGGCGAGCGCATCATCGACATCAT
 CGCCACCGACATCCAGACCAAGGAGCTGCAGAGCAGATCATCAAGATCC
 AGAACTTCGCGGTGTAACCGGACTCCCGGACCCCATCTGGAAGGGC
 CCGCCAAAGCTGTGTGGAAGGGCGAGGGCGCGTGTGTATCCAGGACAA
 CTCCGACATCAAGGTGTGTGCCCGCCGCAAGGCCAAGATCATCAAGGACT
 ACGGCAAGCAGATGGCCGGCGCGACTGCTGTGGCCGCGCCGACGAG
 GACTAA

M.con.gag (group M consensus gag)

MGARASVLSGGKLDWEKIRLRPGGKKYRLKHLVWASRELERFALNPGLLETSEG CKQIIGQLQPA
 LQTGSEELRSLYNTVATLYCVHQRIEVKDTKEALEKIEEEQNKSQKTQQAADKGNSSKVSQNYPIVQN
 LQGQMVHQAI SPRTLNAWVKVIEEKAFSPEVIMFSAISEGATPQDLNMTNTVGGHQAAMQMLKDTINE
 EAAEWDRLHPVHAGPIPPGQMPREPRGSDIAGTTSTLQEQIAWMTSNPPIPVGEIYKRWIILGLNKIVRM
 SPVSILDIRQGPKEFRDYVDRFFKTLRAEQATQDVKNWMTDTLLVQANPDCKTILKALGPGATLEMM
 TACQGVGGPGHKARVLAEMSQVTNAAIMMQRGNFKGORRIKCFNCGKEGHIARNCRAPRKKGCKGCKG
 EGHQMKDCTERQANFLGKIWPSNKGPRPGNFLQSRPEPTAPPAESFGFGEETPSPKQEPKDKPEPLTSLK
 SLFGNDPLSQ

Fig. 19E

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Fig. 19F

M.con.pol (group M consensus pol)
 MPQITLWQRPLVTKIGGQLKEALLaTGADDTVLEEINLPGKWPKMIGGIGGFIKVRQYDQILEICGK
 KAIGTVLGGPTVNIIGRNMLTQIGCTLNFPIPIETVPVKLPMDGPKVKQWPLTEEKIKALTEIGTE
 MEKEGKISKIGPENPYNTPIFAIKKOSTKWRKLVDFRELNRKTQDFWEVQLGIPHAGLKKKSVTVLD
 VGDAYFSVPLDEDFRKYTAFTIPSINNETPGIRYQYNVLPQGWKSPAFQSSMTKILEPFRTONPEIM
 YQYMDLLVGSLEIGQHRAKIEELREHLRWGFTTPDKKHQKEPPFLWMGYELHPDKWTVQPIQLPEKD
 SWTVNDIQKLVGKLNWASQIYPGKVKQLCKLRGAKALTDIVPLTEAELELAENREILKEPVHGVYYD
 PSKDLIAEIQKQGGQDQWYQIYQEPFKNLTKGYAKMRSATNDVKQLTEAVQKATESIVWVGKTPKFR
 LPIQKETWETWTEYWQATWIPWEFVNTPLVKLWYQLEKEPIAGAEFTYVDGAANRETKLGKAGYVTD
 RGRQKVSLETNTQKTELQAIHLALQDSGSEVNIIVTDSQYALGIAQDPKSESELVNIQIEQLIKKEK
 VYLSWVPAHKIGGIGNEQVDKLVSTGIRKVLFDGIDKAQEEHEKYHSNWRAMASDFNLPPIVAKEIVASC
 DKCQLKGEAMHGQVDCSPGIWQLDCTHLEGKILVAVHVASGYIEAEVPAETGQETAYFILKLAGRWPV
 KVHTDNGSNFTSAAVKACWVAGIQQEFPIPNPQSQGVVSEMNKELKKIGQVRDQAEHLKTAVQMAV
 FIHNFKRKGIGGYSAGERIIDIAIDIQTKELQKIQTNFRVYVYRDSRDPWKGPAKLLWKGEAW
 IQNDSIKVVRPRRKAIRDYGKQMAGDDCVAGRQDED

Fig. 19G

M.con.nef (group M consensus nef)
 MGKWSKSSIVGWPAVRERIRRTHPAAEGVGAVSQDLDKHGAITSNTAANNPDCAWLEAQEEEEVEGFP
 VRPQVPLRPMTYKAALDLSHFLEKEGGLEGLIYSKKRQEIILDMVYHTQGYFPDQWQNTPGGIRYPLTF
 GWCFLVPVDPPEEVEEANEENGENNSLLHPMCQHGMEDEREVLWKKFDSRLALRHARELHPEYYKDC

Fig. 19H

C.con.pol (subtype C consensus pol)
 MPQITLWQRPLVSIKVGQIKEALLaTGADDTVLEEINLPGKWPKMIGGIGGFIKVRQYDQILEICGK
 KAIGTVLGGPTVNIIGRNMLTQIGCTLNFPIPIETVPVKLPMDGPKVKQWPLTEEKIKALTAICEE
 MEKEGKITIGPENPYNTPIFAIKKOSTKWRKLVDFRELNRKTQDFWEVQLGIPHAGLKKKSVTVLD
 VGDAYFSVPLDEGFRKYTAFTIPSINNETPGIRYQYNVLPQGWKSPAFQSSMTKILEPFRQONPEIM
 YQYMDLLVGSLEIGQHRAKIEELREHLRWGFTTPDKKHQKEPPFLWMGYELHPDKWTVQPIQLPEKD
 SWTVNDIQKLVGKLNWASQIYPGKVKQLCKLRGAKALTDIVPLTEAELELAENREILKEPVHGVYYD
 PSKDLIAEIQKQGGQDQWYQIYQEPFKNLTKGYAKMRTAHTNDVKQLTEAVQKAMESIVWVGKTPKFR
 LPIQKETWETWTEYWQATWIPWEFVNTPLVKLWYQLEKEPIAGAEFTYVDGAANRETKIGKAGYVTD
 RGRQKVSLETNTQKTELQAIHLALQDSGSEVNIIVTDSQYALGIAQDPKSESELVNIQIEQLIKKER
 VYLSWVPAHKIGGIGNEQVDKLVSSGIRKVLFDGIDKAQEEHEKYHSNWRAMASEFNLPPIVAKENVASC
 DKCQLKGEAMHGQVDCSPGIWQLDCTHLEGKILVAVHVASGYIEAEVPAETGQETAYFILKLAGRWPV
 KVHTDNGSNFTSAAVKACWVAGIQQEFPIPNPQSQGVVSEMNKELKKIGQVRDQAEHLKTAVQMAV
 FIHNFKRKGIGGYSAGERIIDIAIDIQTKELQKIQTNFRVYVYRDSRDPWKGPAKLLWKGEAW
 IQNDSIKVVRPRRKAIRDYGKQMAGDDCVAGRQDED

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Fig. 20A

B.con.gag (subtype B consensus gag. The amino acid sequence is different from Los Alamos Database August 2002)

GCCGCCGCCATGGGCGCCCGCGCCTCCGTGCTGTCCGGCGGCGAGCTGGA
CCGCTGGGAGAAGATCCGCCTGCGCCCCGGCGGCAAGAAGAAGTACAAGC
TGAAGCACATCGTGTGGGCCTCCCGCGAGCTGGAGCGCTTCGCCGTGAAC
CCCGCCCTGCTGGAGACCTCCGAGGGCTGCCGCCAGATCCTGGGCCAGCT
GCAGCCCTCCCTGCA GACCGGCTCCGAGGAGCTGCGCTCCCTGTACAACA
CCGTGGCCACCCTGTACTGCGTGCACCAGCGCATCGAGGTGAAGGACACC
AAGGAGGGCCCTGGAGAAGATCGAGGAGGAGCAGAACAAGTCCAAGAAGAA
GGCCCAGCAGGCCGCGCCGACACCGGCAACTCCTCCCAGGTGTCCCAGA
ACTACCCCATCGTGCAGAACCTGCAGGGCCAGATGGTGCACCAGGCCATC
TCCCCCGCACCCTGAACGCCTGGGTGAAGGTGGTGGAGGAGAAGGCCTT
CTCCCCCGAGGTGATCCCCATGTTCTCCGCCCTGTCCGAGGGGCGCCACCC
CCCAGGACCTGAACACCATGCTGAACACCGTGGGCGGCCACCAGGCCGCC
ATGCAGATGCTGAAGGAGACCATCAACGAGGAGGCCGCCGAGTGGGACCG
CCTGCACCCCGTGACGCGCCGCCCATCGCCCCCGGCCAGATGCGCGAGC
CCCGCGGCTCCGACATCGCCGGCACCACCTCCACCCTGCAGGAGCAGATC
GGCTGGATGACCAACAACCCCCCATCCCCGTGGGCGAGATCTACAAGCG
CTGGATCATCCTGGGCCTGAACAAGATCGTGCGCATGTACTCCCCACCT
CCATCCTGGACATCCGCCAGGGCCCCAAGGAGCCCTTCCGCGACTACGTG
GACCGCTTCTACAAGACCCTGCGCGCCGAGCAGGCCTCCCAGGAGGTGAA
GAACTGGATGACCGAGAC CCTGCTGGTGCAGAACGCCAACCCCGACTGCA
AGACCATCCTGAAGGCCCTGGGCCCCGCGCCACCCTGGAGGAGATGATG
ACCGCCTGCCAGGGCGTGGGCGGCCCGGCCACAAGGCCCGCGTGTGGC
CGAGGCCATGTCCCAGGTGACCAACTCCGCCACCATCATGATGCAGCGCG
GCAACTTCCGCAACCAGCGCAAGACCGTGAAGTGCTTCAACTGCGGCAAG
GAGGGCCACATCGCCAAGAACTGCCGCGCCCCCGCAAGAAGGGCTGCTG
GAAGTGCGGCAAGGAGGGCCACCAGATGAAGGACTGCACCGAGCGCCAGG
CCAACTTCCTGGGCAAGATCTGGCCCTCCCAAGGGCCGCCCCGGCAAC
TTCCTGCAGTCCCGCCCCGAGCCCAACCGCCCCCCCCGAGGAGTCCTTCCG
CTTCGGCGAGGAGACCACACCCCTCCCAAGCAGGAGCCCATCGACA
AGGAGCTGTACCCCTGGCCTCCCTGCGCTCCCTGTTTCGGCAACGACCCC
TCCTCCAGTAA

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Fig. 20B

B.con.env (subtype B consensus env. The amino acid sequence is different from Los Alamos Database August 2002)

GCCG CCGCCATGCGCGTGAAGGGCATCCGCAAGAACTACCAGCACCTGTG
GCGCTGGGGCACCATGCTGCTGGGCATGCTGATGATCTGCTCCGCGCCG
AGAAGCTGTGGGTGACCGTGTACTACGGCGTGCCCGTGTGGAAGGAGGCC
ACCA CCAACCCTGTTCTGCGCCTCCGACGCCAAGGCCTACGACACCGAGGT
GCACAACGTGTGGGCCACCCACGCCCTGCGTGCCCAACGACCCCAACCCCC
AGGAGGTGGTGCTGGAGAACGTGACCGAGAAGCTTCAACATGTGGAAGAAC
AACATGGTGGAGCAGATGCACGAGGACATCATCTCCCTGTGGGAC CAGTC
CCTGAAGCCCTGCGTGAAGCTGACCCCTGTGCGTGACCCTGAACTGCA
CCGACCTGAAGAACAACCTGCTGAACACCAACTCCTCCTCGGCGAGAAG
ATGGAGAAGGGCGAGTCAAGAACTGCTCCTTCAA CATCA CCACTC CAT
CCGCGACAAGGTGCAGAAAGGATACGCCCTGTTCTACAAGCTGGA CGTGG
TGCCCATCGACAACAACAACAACACTCCTACCGCCTGATCTCCTGCAAC
ACCTCCGTGATCACCCAGGCCGTGCCCAAGGTGTCCTTCGAGCCCATCCC
CATC CACTACTGCGCCCGCGCGGCTTCGCATCCTGAAGTGCAACGACA
AGAAGTTCAACGGCACCGGCCCTGCACCAACGTGTCCACCGTGCAGTGC
ACCCACGGCATCCGCCCGGTGGTGTCCAAC CAGCTGCTGCTGAACGGCTC
CCTGGCCGAGGAGGAGGTGGTGATCGCTCCGAGAAGCTTCAACGACAACG
CCAAGACCATCATCGTGCAGCTGAACGAGTCCGTGGAGATCAACTGCACC
CGCCCAACAACAACAACCCGCAAGTCCATCCACATCGGCCCGGCCGCGC
CTTCTACACCAACGGCGAGATCATCGGCGCATCCGCCAGGCCCACTGCA
ACATCTCCCGCGCCAAGTGGAAACAACACCTGAAGCAGATCGTGAAGAAG
CTGCGCGAGCAGTTCCGGCAACAAGACCA TCGTGTTCAACCAGTCCCTCCG
CGGCGACCCCGAGATCGTGATGCACTCCTTCAACTGCGGCGGCGAGTTCT
TCTACTGCAACACCACCCAGCTGTTCAA CTCCACCTGGAAACGACAACGGC
ACCTGGAACAACACCAAGGACAAGAACA CCATCAC CCTGC CTTGCCG CAT
CAAGCAGATCATCAACATGTGGCAGGAGGTGGGCAAGGCCATGTA CGCCC
CCCCCATCCGCGGCCAGATCCGCTGCTCCTCCAACATCACCGGCTGCTG
CTGACCCGCGACGGCGGCAACAACAACAACGACACGAGATCTTTCGCCC
CGGCGGCGGCGACATGCGCGACAAC TGGCGCTCCGAGCTGTACAAGTACA
AGGTGGTGAAGATCGAGCCCC TGGGCGTGGCCCCACCAAGGCCAAGCGC
CGCGTGGTG CAGCGCGAGAAGCGCGCCGTGGGCATCGGCGCCATGTTCT
GGGCTTCTGGGCGCCGCCGCTCCACCATGGGCGCCGCTCATGACCC
TGACCGTG CAGGCCCGCCAGCTGCTGTCGGGCATCGTGCAACAGCAGAAC
AACCTGCTGCGCGCCATCGAGGCCAGCAGCACCTGCTGCAGCTGACCGT
GTGGGGCATCAAGCAGCTGCAGGCCCGCGTGTGGCCGTGGAGCGCTACC
TGAAAGGACCAGCAGCTGCTGGGCATCTGGGGCTGCTCCGGCAAGCTGATC
TGCA CCAACCACCGTGCCCTGGAACGCCCTCTGGTCAACAAGTCCCTGGA
CGAGATCTGGGAACAATGACCTGGATGGAGTGGAGCGCGAGATCGACA
ACTACACCTCCCTGATCTACACCCTGATCGAGGAGTCCCAGAACCAGCAG
GAGAAGAACGAGCAGGAGCTGCTGGAGCTGGACAAGTGGGCCCTCCCTGTG
GAACTGGTTGACATCACCAACTGGCTGTGGTACATCAAGATCTTCATCA
TGATCGTGGGCGGCCCTGATCGGCCTGCGCATCGTGTTCCGCGTGCTGTCC
ATCGTGAAACCGCGTGCGCCAGGGCTACTCCCTGTCCTTCAGACCCG
CCTGCCCGCCCCCGCGGCCCGACCGCCCGAGGGCATCGAGGAGGAGG
GCGGCGAGCGCGACCGCGACCGCTCCGGCCCTGGTGA CCGGTTCTCTG
GCCCTGATCTGGGACGACCTGCGCTCCCTGTGCTGTCTCTTACCAACG
CCTGCGCGACCTGCTGCTGATCGTGACC CGCATCGTGGAGCTGCTGGGCC
GCCGCGGCTGGGAGGTGCTGAAGTACTGGTGGAACCTGCTGCAGTACTGG
TCCAGGAGCTGAAGAAGTCCGCCGTGTCCCTGCTGAACGCCACCGCAT
CGCCGTGGCGAGGGCACCGACCGCGTGATCGAGGTGGTG CAGCGCGCT
GCCGCGCATCTGCA CATCCCGCGCGCATCCGCAGGGCCTGGAGCGC
GCCCTGCTGTAA

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Fig. 20C

B.con.gag (subtype B consensus gag)

MGARASVLSGGELDRWEKIRL R PGGKKKKYKLKHIVWASRELERFAVNPGLLETSEGRQILGQLQPSLQT
 GSEELRSLYNTVATLYCVHQRIEVKDTKEALEKIEEEQNKS KKAQQAADTGNSSQVSQNYPIVQN LQG
 QMVHQAISPRTLNAWKVVEEKAFSPDEVIPMFSA LSEGATPQDLNTMLNTVGGHQAAMQMLKETINEEAA
 EWDRLHPVHAGPIAPGQMRPRGSDIAGTTSTLQEQIGWMTNNPPIPVGEIYKRWIILGLNKIV RMYSP T
 SILDIRQGEKPEFRDYVDRFYKTLRAEQASQEVKNWMTETLLVQNANPDCKTILKALGPAATLEEMMTAC
 QGVGGPHKARVLAEAMSQVTSATIMMQRGNFRNQRKTVKFCNCGKEGHIAKNCRAPRKKGCKWCKGKEG
 HQMKDCTERQANFLGKIWPSHKGRPGNFLOSRPEPTAPPEESFRFGEETTPSQKQEPIDKELYPLASLR
 SLFGNDPSSQ

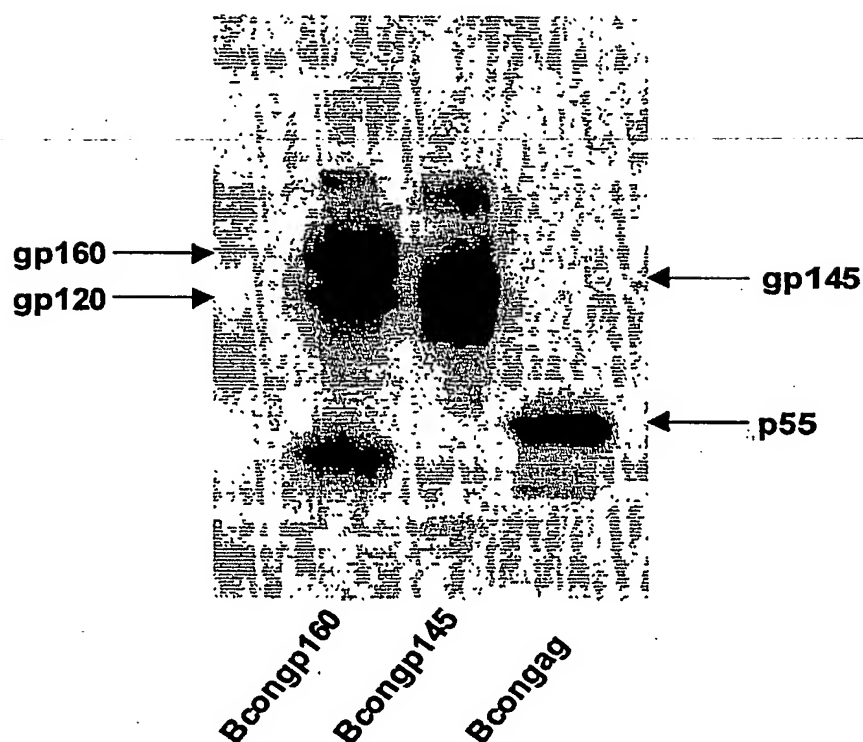
Fig. 20D

B.con.env (subtype B consensus env)

MRVKGIRKNYQHLLWRWGTMLLGLMLMICSAAEKLWTV Y YGVPVWKEATTTLFCASDAKAYDTEVHNWAT
 HACVPTDPNPQEVVLENTVENFMWKNMVEQMHEDIISLWDQSLKPCVKLTPLCVTLNCTDLKNNLLNT
 NSSSGEKMEKEIKNCSEFNITTSIRDKVQKEYALFYKLDVVPIDNNNNTSYRLISCNSTSVITQACPVSF
 EPIPIHYCAPAGFAILKCNCKKFGTGPCTNVSTVQCTHGIRPVVSTQLLLNGSLAESEEVVIRSENF TDN
 AKTIIVQLNESVEINCTRPNNNTRKSIHIGPGRAFYTTGEIIGDIRQAHCNISRAKWNNTLKQIVKKLRE
 QFGNKTIVFNQSSGGDPEIVMHSFNCGGEFFYCNTTQLFNSTWNDNGTWNNTKDKNITITLPCR IKQI INM
 WQEVGKAMYAPPPIRGQIRCSSNITGLLTRDGGNNNDTEIFRPGGDMRDNRSELYKYKVVKIEPLGV
 APTKAKRRVVQREKRAVGIGAMFLGFLGAAGSTMGAA SMTLTVQARQLLSGI VQQQNNLLRAIEAQOHL L
 QLTWGIKQLQARVLAVERYLKDQQLLGIWGC SGKLCITTTVPWNASWSNKS LDEIWDNMTWMEWEREID
 NYTSLIYTLIEESQEQEKNEQELLELDK WASLWNWFDTNWLWYIKIFIMI VGG LIGLRIVFAVLSIVN
 RVRQGSPLSFQTRLPA PRGPDRPEGIEEGGERDRDRSGRLVDGFLALIWDDLRLSLCLFSYHRLRDL L L
 IVTRIVELLGRRGWEVLKYWNLLQYWSQELKN SAVSLLNATAIAVAEGTDRVIEVVQRA CRAILHI PR R
 IRQGLERALL

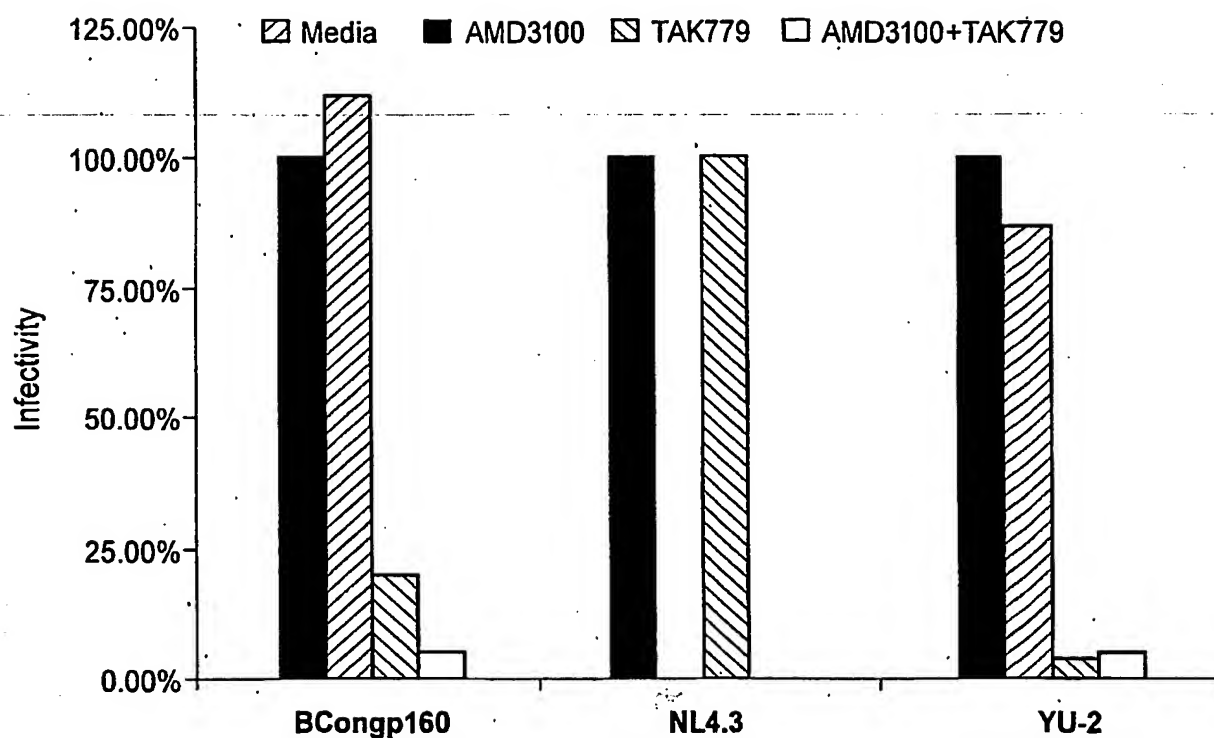
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Fig. 21



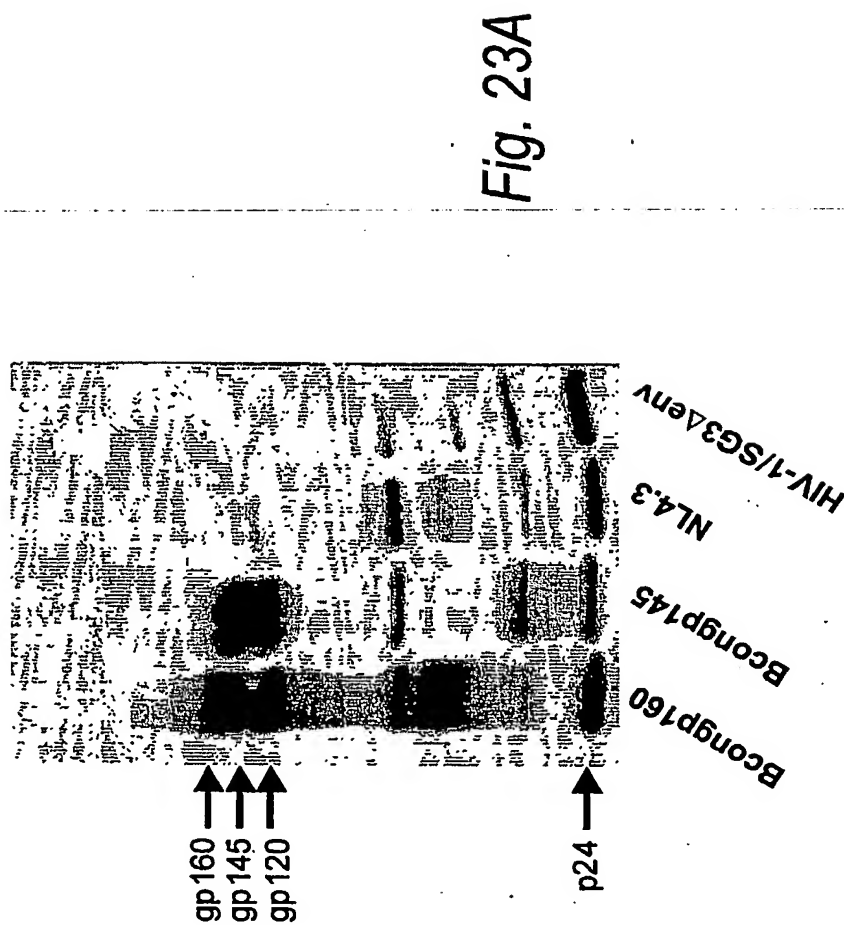
Expression of subtype B consensus *env* and *gag* genes in 293T cells. Plasmids containing codon-optimized subtype B consensus *gp160*, *gp140*, and *gag* genes were transfected into 293T cells, and protein expression was examined by Western Blot analysis of cell lysates. 48-hours post-transfection, cell lysates were collected, total protein content determined by the BCA protein assay, and 2 μ g of total protein was loaded per lane on a 4-20% SDS-PAGE gel. Proteins were transferred to a PVDF membrane and probed with serum from an HIV-1 subtype B infected individual.

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Fig. 22**Co-receptor usage of subtype B consensus envelopes.**

Pseudotyped particles containing the subtype B consensus gp160 Env were incubated with DEAE-Dextran treated JC53-BL cells in the presence of AMD3100 (a specific inhibitor of CXCR4), TAK779 (a specific inhibitor of CCR5), and AMD3000+TAK779 to determine co-receptor usage. NL4.3, an isolate known to utilize CXCR4 and YU-2, a known CCR5-using isolate; were included as controls.

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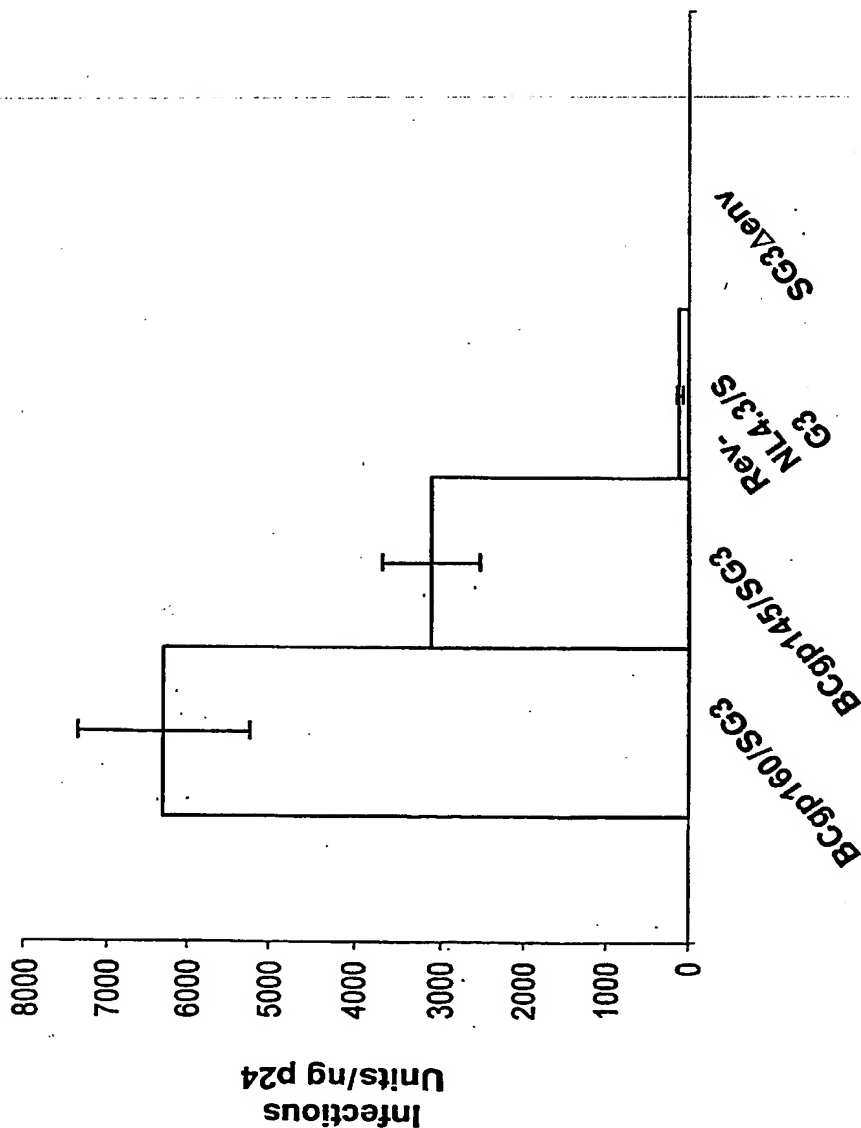


Trans complementation of *env*-deficient HIV-1 with codon-optimized subtype B consensus *gp160* and *gp140* genes.

Plasmids containing codon-optimized, subtype B consensus *gp160* or *gp140* genes were co-transfected into 293T cells with an HIV-1/SG3Δ*env* provirus. 48-hours post-transfection cell supernatants containing pseudotyped virus were harvested, clarified in a tabletop centrifuge, filtered through a 0.2μM filter, and pellet through a 20% sucrose cushion. Quantification of p24 in each virus pellet was determined using the Coulter HIV-1 p24 antigen assay; 25ng of p24 was loaded per lane on a 4-20% SDS-PAGE gel. Proteins were transferred to a PVDF membrane and probed with anti-HIV-1 antibodies from infected HIV-1 subtype B patient serum. Trans complementation with a rev-dependent NL4.3Δ*env* was included for control.

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Fig. 23B



Infectivity of virus particles containing the subtype B consensus envelope.

Infectivity of pseudotyped virus containing consensus B gp160 or gp140 was determined using the JC53-BL assay. Sucrose cushion purified virus particles were assayed by the Coulter p24 antigen assay, and 5-fold serial dilutions of each pellet were incubated with DEAE-Dextran treated JC53-BL cells. Following a 48-hour incubation period, cells were fixed and stained to visualize β -galactosidase expressing cells. Infectivity is expressed as infectious units per ng of p24.

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Fig. 24B

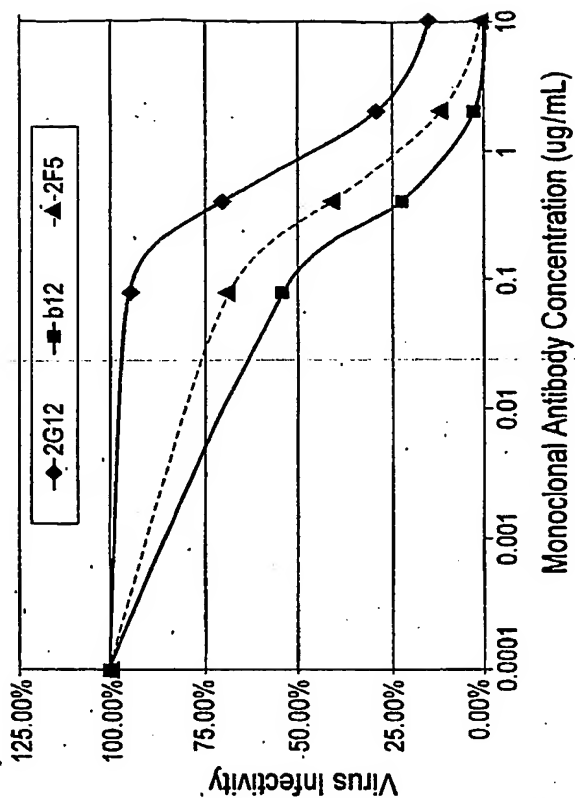


Fig. 24A

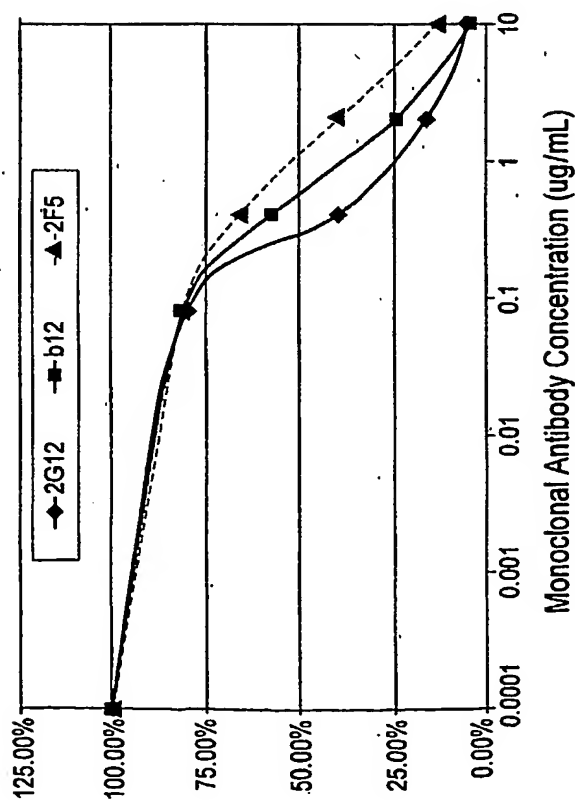


Fig. 24C

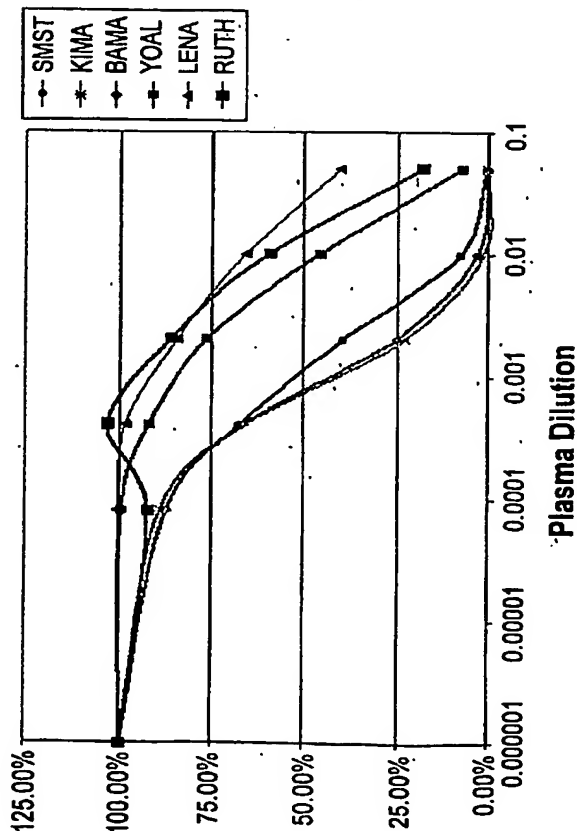
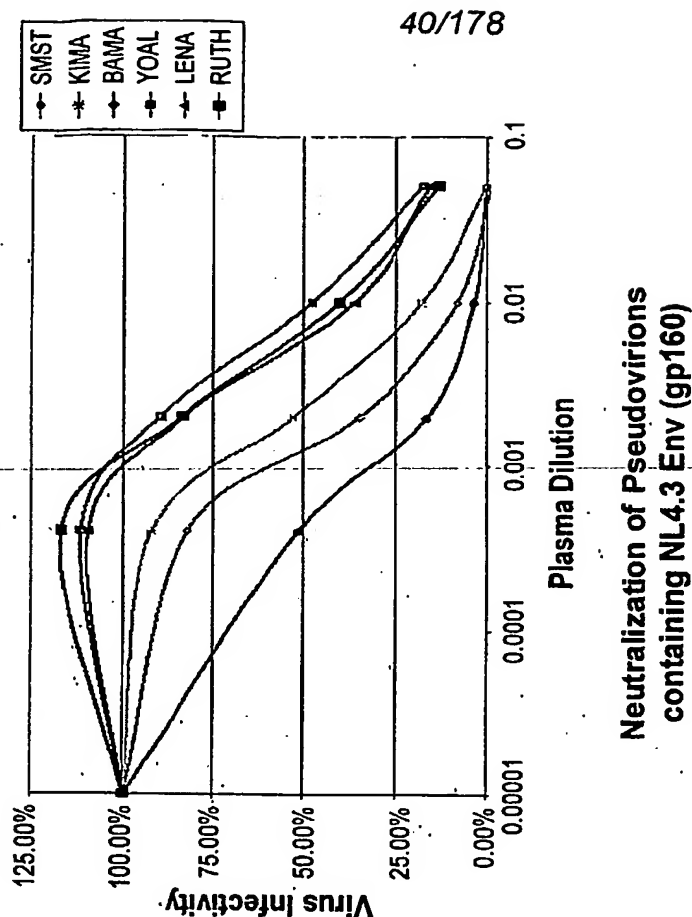


Fig. 24D



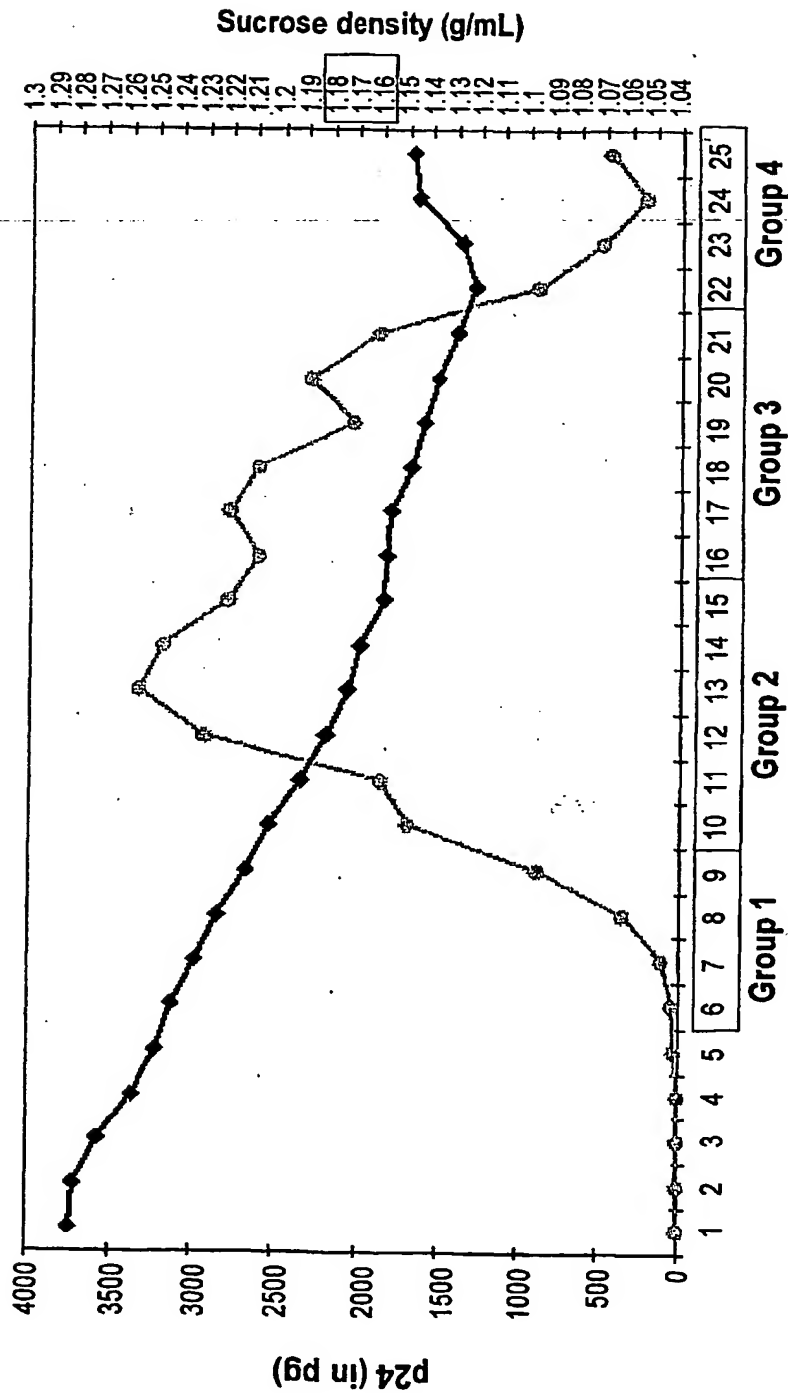
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Neutralization sensitivity of virions containing subtype B consensus gp 160 envelope.

Equivalent amounts of pseudovirions containing the subtype B consensus or NL4.3 Env (gp160) (1,500 infectious units) were preincubated with three different monoclonal neutralizing antibodies and a panel of plasma samples from HIV-1 subtype B infected individuals, and then added to the JC53-BL cell monolayer in 96-well plates. Plates were cultured for two days and luciferase activity was measured as an indicator of viral infectivity. Virus infectivity was calculated by dividing the luciferase units (LU) produced at each concentration of antibody by the LU produced by the control infection. The mean 50% inhibitory concentration (IC_{50}) and the actual % neutralization at each antibody dilution were then calculated for each virus. The results of all luciferase experiments were confirmed by direct counting of blue foci in parallel infections.

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Fig. 25A



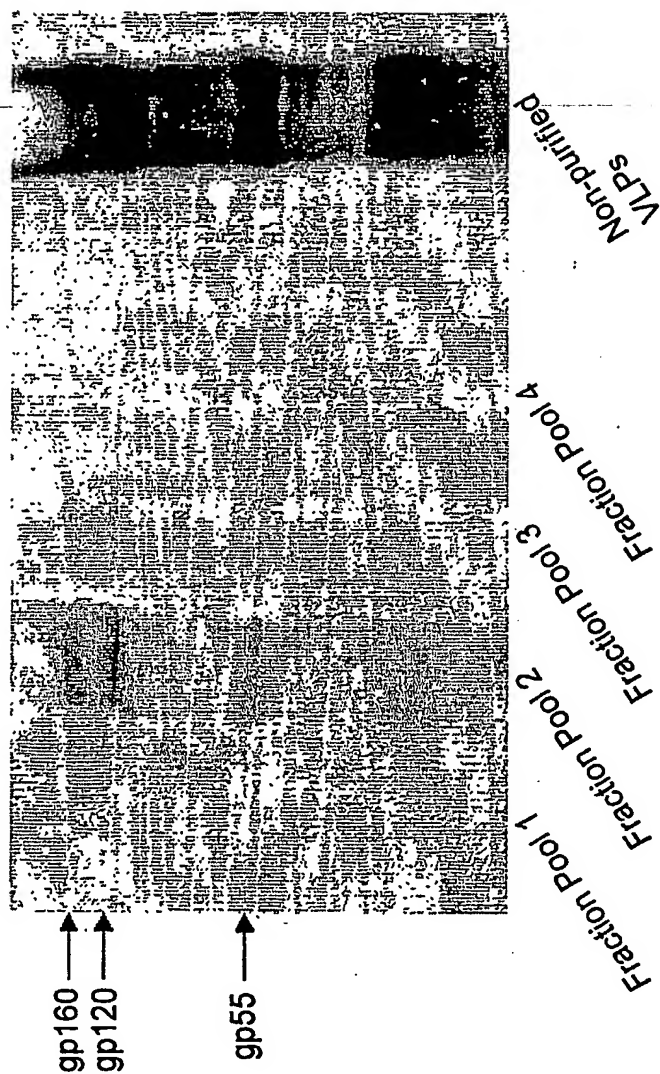
Fractions (0.5 mL increments)

Density and p24 analysis of sucrose gradient fractions.

0.5ml fractions were collected from a 20-60% sucrose gradient. Fraction number 1 represents the most dense fraction taken from the bottom of the gradient tube. Density was measured with a refractometer and the amount of p24 in each fraction was determined by the Coulter p24 antigen assay. Fractions 6-9, 10-15, 16-21, and 22-25 were pooled together and analyzed by Western Blot. As expected, virions sedimented at a density of 1.16-1.18 g/ml.

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Fig. 25B



VLP production by co-transfection of subtype B consensus gag and env genes.

293T cells were co-transfected with subtype B consensus gag and env genes. Cell supernatants were harvested 48-hours post-transfection, clarified through at 20% sucrose cushion, and further purified through a 20-60% sucrose gradient. Select fractions from the gradient were pooled, added to 20ml of PBS, and centrifuged overnight at 100,000 x g. Resuspended pellets were loaded onto a 4-20% SDS-PAGE gel, proteins were transferred to a PVDF membrane, and probed with plasma from an HIV-1 subtype B infected individual.

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Fig. 26A**Year 2000 Con-S 140CFI.Env**

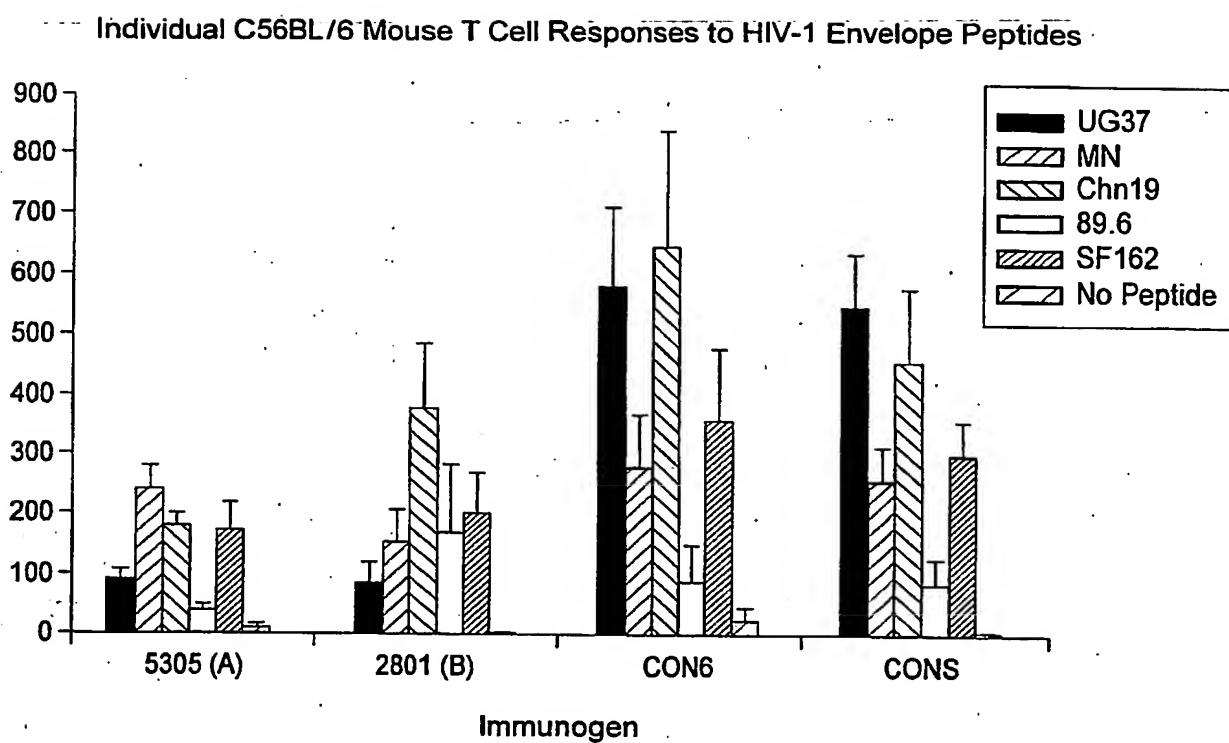
MRVRGIQRNCQHLWRWGTLILGMLMICSAAENLWVTVYYGVPVWKEANTTLFCASDAKAYDTEVH
 NVWATHACVPTDPNPQEIIVLENTENFNMWKNMVEQMHEDIISLWDQSLKPCVKLTPLCVTLNC
 TNVNVNTNTNNTTEEKGEIKNCSFNITTEIRDKKQKVYALFYRLDVVPIDNNNNSSNYRLINCNT
 SAITQACPKVSFEPIPIHYCAPAGFAILKCNDKKFNGTGPKNVSTVQCTHGIKPVVSTQLLNG
 SLAEIIIIRSENITNNAKTIIVQLNESVEINCTRPNNNTRKSIRIGPGQAFYATGDIIGDIRQA
 HCNISGTKWNKTLQOVAKKLEHFNNKTIIFKPSSGGDLITTHSFNCRGEFFYCNTSGLFNSTW
 IGNGTKNNNNTNDTITLPCRIKQIINMWQGVGQAMYAPPIEGKITCKSNITGLLLTRDGGNNNTN
 ETEIFRPGGDMRDNRSELYKYKVVKIEPLGVAPTAKLTVQARQLLSGIVQQQSNLLRAIEAQ
 QHLLQLTVWGIKQLQARVLAVERYLKDQQLIWDNMTWMEWEREINNYTDIIYSLIEESQNQQEK
 NEQELLALDKWASLWNWFDITNWLW

A gp140 CFI is referred to HIV-1 envelope design with the cleavage-site-deleted (C), fusion-site-deleted (F) and gp41 immunodominant region-deleted (I) in addition to the deletion of transmembrane and cytoplasmic domains.

Fig. 26B**Codon-optimized Year 2000 Con-S 140CFI. seq**

ATGCGCGTGCGCGGCATCCAGCGCAACTGCCAGCACCTGTGGCGCTGGGGCACCCTGATCCTGGG
 CATGCTGATGATCTGCTCCGCCGCCGAGAACCCTGTGGGTGACCGTGTAACGGCGTGCCCGTGT
 GGAAGGAGGCCAACACCACCCTGTTCTGCGCCTCCGACGCCAAGGCCCTACGACACCGAGGTGCAC
 AACGTGTGGGCCACCCACGCCTGCGTGCCACCGACCCCAACCCCCAGGAGATCGTGCTGGAGAA
 CGTGACCGAGAACTTCAACATGTGGAAGAACAACATGGTGAGCAGATGCACGAGGACATCATCT
 CCCTGTGGGACCAGTCCCTGAAGCCCTGCGTGAAGCTGACCCCCCTGTGCGTGACCCTGAACCTGC
 ACCAACGTGAACGTGACCAACACCACCAACAACACCGAGGAGAAGGGCGAGATCAAGAACTGCTC
 CTTCAACATCACCACCGAGATCCGCGACAAGAAGCAGAAGGTGTACGCCCTGTTCTACCGCCTGG
 ACGTGTGTCCTATCGACGACAACAACAACACTCCTCCAACCTACCGCCTGATCAACTGCAACACC
 TCCGCCATCACCAGGCCTGCCCCAAGGTGTCTTCGAGCCCATCCCCATCCACTACTGCGCCCC
 CGCCGGCTTCGCCATCCTGAAGTGCAACGACAAGAAGTTCAACGGCACCAGGCCCTGCAAGAACG
 TGTCCACCGTGCAGTGCACCCACGGCATCAAGCCCGTGGTGTCCACCCAGCTGCTGCTGAACGGC
 TCCCTGGCCGAGGAGGAGATCATCATCCGCTCCGAGAACATCACCACAACGCAAGACCATCAT
 CGTGACGCTGAACGAGTCCGTGGAGATCAACTGCACCCGCCCAACAACAACACCCGCAAGTCCA
 TCCGCATCGGCCCGGCCAGGCCTTCTACGCCACCGGCGACATCATCGGCGACATCCGCCAGGCC
 CACTGCAACATCTCCGGCACCAAGTGAACAGACCCCTGCAGCAGGTGGCCAAGAAGCTGCGCGA
 GCACTTCAACAACAAGACCATCATCTTCAAGCCCTCCTCCGGCGGCGACCTGGAGATCACCACCC
 ACTCCTTCAACTGCCGCGGCGAGTTCTTCTACTGCAACACCTCCGGCCTGTTCAACTCCACCTGG
 ATCGGCAACGGCACCAAGAACAACAACAACACCAACGACACCATCACCTGCCCTGCCGCATCAA
 GCAGATCATCAACATGTGGCAGGGCGTGGGCCAGGCCATGTACGCCCCCCCCATCGAGGGCAAGA
 TCACCTGCAAGTCCAACATCACCGGCCTGTGTGTGACCCGCGACGGCGGCAACAACAACACCAAC
 GAGACCGAGATCTTCCGCCCCGGCGGCGGCGACATGCGCGACAACCTGGCGCTCCGAGCTGTACAA
 GTACAAGGTGGTGAAGATCGAGCCCCCTGGGCGTGGCCCCCACCAAGGCCAAGCTTACCGTGCAGG
 CCGCCAGCTGCTGTCGGCATCGTGAGCAGCAGTCCAACCTGCTGCGCGCCATCGAGGCCAG
 CAGCACCTGCTGCGAGTGAACGTGTGGGACATCAAGCAGCTGCAGGCCCGCGTGTGGCCGTGGA
 GCGCTACCTGAAGGACCAGCAGCTCGAGATCTGGGACAACATGACCTGGAGTGGGAGCGCG
 AGATCAACAACCTACCCGACATCATCTACTCCCTGATCGAGGAGTCCCAGAACCAGCAGGAGAAG
 AACGAGCAGGAGCTGCTGGCCCTGGACAAGTGGGCCTCCCTGTGGAACCTGGTTCGACATCACCAA
 CTGGCTGTGGTGAGGATCC

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Fig. 27

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Fig. 28A**Design of expression-optimized HIV-1 envelope gp140CF****Con-B-2003 Env.pep (841 a.a.)***

MRVKGIRKNYQHLLWRWGTMLLGMLMICSAAEKLWTVYYGVVPVWKEATTTLCASDAKAYDTEVHNWVWATHACVPTDPNPQEVVL
 ENVTFENFNMWKNMVEQMHEDIISLWDQSLKPCVKLTPLCVTLNCTDLMNATNTNTTIIYRWGEIKNCSEFNITTSIRDKVQKEY
 ALFYKLDVVPIDNDNTSYRLISCNSTSVITQACPVSFEPIPIHYCAPAGFAILKCNCKFNGTGPCTNVSTVQCTHGIRPVSSTQ
 LLLNGSLAEVEEVVIRSENFDTNAKTIIVQLNESVEINCTRPNNNTRKSIHIGPGAFYTTGEIIGDIRQAHCNISRAKWNNTLKQ
 IVKKLREQFGNKTIVFNQSSGGDPEIVMHSFNCGGEFFYCNTTQLFNSTWNGTWNTEGNTILPCRIKQIINMWQEVGKAMYAPP
 IRGQIRCSSNITGLLLTRDGGNNETEIFRPGGDMRDNRSELYKYKVVKIEPLGVAPTAKRRRVVQREKRAVGIGAMFLGFLGA
 AGSTMGAASMTLTVQARQLLSGIVQQNNLLRAIEAQHLLQLTVWGIKQLQARVLAVERYLKDQQLLGIWGCSSGKLICTTAVPW
 NASWSNKSLEIWDNMTWMEWEREIDNYTSLIYTLIEESQSQEKNQELLELDKWASLWNWFDITNWLWYIKIFIMIVGGLVGL
 RIVFAVLSIVNRVROGYSPLSFQTRLPAPRGPDPEGIEEGGERDRDRSRLVDGFLALIWDDLRLSLCFSYHRLRDLILLIVTR
 IVELLGRRGWEVLKYWNLLQYWSQELKNSAVSLNATAIAVAEGTDRVIEVQACRAILHIPRRIRQGLERALL

*Amino acid sequence underlined is the fusion domain that will be deleted in 140CF design and the "W" underlined with red color is the last amino acid at the C terminus, and all the remaining amino acids after the "W" will be deleted in 140CF design.

Fig. 28B**Con-B-140CF.pep (632 a.a.)****Nick name: 002**

MRVKGIRKNYQHLLWRWGTMLLGMLMICSAAEKLWTVYYGVVPVWKEATTTLCASDAKAYDTEVHNWVWATHACVPTDPNPQEVVL
 ENVTFENFNMWKNMVEQMHEDIISLWDQSLKPCVKLTPLCVTLNCTDLMNATNTNTTIIYRWGEIKNCSEFNITTSIRDKVQKEY
 ALFYKLDVVPIDNDNTSYRLISCNSTSVITQACPVSFEPIPIHYCAPAGFAILKCNCKFNGTGPCTNVSTVQCTHGIRPVSSTQ
 LLLNGSLAEVEEVVIRSENFDTNAKTIIVQLNESVEINCTRPNNNTRKSIHIGPGAFYTTGEIIGDIRQAHCNISRAKWNNTLKQ
 IVKKLREQFGNKTIVFNQSSGGDPEIVMHSFNCGGEFFYCNTTQLFNSTWNGTWNTEGNTILPCRIKQIINMWQEVGKAMYAPP
 IRGQIRCSSNITGLLLTRDGGNNETEIFRPGGDMRDNRSELYKYKVVKIEPLGVAPTAKKTLTVQARQLLSGIVQQNNLLRA
 IEAQHLLQLTVWGIKQLQARVLAVERYLKDQQLLGIWGCSSGKLICTTAVPWNASWSNKSLEIWDNMTWMEWEREIDNYTSLIY
 TLIEESQSQEKNQELLELDKWASLWNWFDITNWLW*

*Amino acids seen in blue color is for easy identification of the junction of the deleted fusion cleavage site.

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Fig. 28C

Codon-optimized Con-B 140CF.seq (1927 nt.)

Nick name: 002

TTCAGTCGACGGCCACCATGAGGGTATTCGGAAAAATTACCAACACCTGTGGCGCTGGGAAACCATGCTCCTTGGTAT
 GCTGATGATTGTCAGTCCCGCGAGAACTTTGGTAAGTGTGTACTACGGCGTTCTGTCTGGAAGGAAGCTACAACCACTCTT
 TTTTGTGCATCCGACGCTAAAGCTTACGACACAGAAGTGCATAATGTTGGCCACCCATGCTGGTCCCTACAGATCCCAACC
 CCCAGGAAGTCGCTCTTGAGATGTACAGAGAAATTTAAACATGTGGAAGAATAATGTTAGAACAAATGCACGAAGACATTAT
 TAGCCTGTGGGACCACTCCTTGAAGCCCTGCGTGAACCTCACTCCACTTTGCGTCACACTTAAGTACTGATTGATGAACGCA
 ACCAACACAAATACTACTATTATATATCGCTGGAGGGGGAATCAAGAACTGCTTTTCAACATCACCACTTCCATAAGGGATA
 AGGTCCAGAAAGAAATATGCCCTGTTTATAAACTTGATGTGTCGCCGATAGACAATGACAACACTAGCTATCGACTGATCTCTTG
 TAACACATCCGTGATTACCCAGCTTGCCAAAGGTGAGCTTGAACCAATACCCATCACTACTGCGCTCCCGCTGGTTTGCC
 ATCCTCAAGTGTAAACGACAAAAAATCAATGGGACCGGACCTTGACAAAACGTGCCACCGTGCAATGTACTACGGAATCAGAC
 CTGTTGTCAAGTACCCAACTCCTTGAACGGGTCTCTCGGGAAGAGGAGTCTGATAGAACGGAATCTTACCAGATAACGC
 TAAACAATCATTTGTGCAACTTAATGAAAGCGTCGAAATTAAGTCACTGACCAAGCAACAAATATACCAAGAAATCTATTACATA
 GGGCCCGCGCGCATTTATACAACCTGGGAAATCATTTGGTACATCAGACAAGCTCATTTGCAATATCTCCCGCGGAAATGGA
 ACAACACCTGAAACAGATCGTGAAGAACTTCGAGAACAAATTCGGTAATAAAACAATCGTATTCACCAAGCTCCGGAGCGGA
 CCTGAGATAGTTATGCATCATTTCAACTGTGGCGGAGTCTTCTTATTGTAACACAACCTCAAGTATGTTGCAAGAAAGTGGAAAG
 GGAACATGGAACAACACAGAGAGGAACATCACTGCTGCTGCGGATTAGCAGATCATTAATATGTTGCAAGAAAGTGGAAAG
 CTATGTACGCCCCGCTATTGCGGACAAATAAGATGCTCTAGTAATATTACCGGATTGTTGCTGACACGCGAGGAGAAATAA
 TGAACACAGAGATATTTAGACCTGGCGGAGGCGACATGAGAGATAACTGGAGAAAGTGAAGCTTTACAAATATAAAGTCGTAAGATA
 GAACCATTTGGGGTAGCACCAACCAAGCAAAAACCTTGACAGTACAGGCTAGGCAGCTGCTGAGCGGAATCGTCAACACAAA
 ATAATCTTCTCGAGCCATAGAACGACACAAACATCTGTTGACGTGACAGTATGGGAAATCAACAGCTTCAGGCAAGAGTGCT
 GGCCGTCGAGAGATACCTCAAGATCAACAACTGCTGGGCATATGGGGATGTTCCGGTAAACTCATATGCACTACCGCCGTGCC
 TGGAAACGCGAGCTGGTCTAATAATCCCTGGATGAAATTTGGACAACATGACTTGGATGGAATGGAAACGGGAAATTGACAACT
 ATACTAGTTTGTATTATCTGATCGAAGATCTCAGAACCAACAGGAGAAAACGAAACAGGAAGTCTGCTGGAAGTGGACAAGTG
 GGCATCATTTGGGAAGTGGTTGACATTACTAACTGGCTGTGTAAGATCTTACAA

(For all 140CF design shown here and below, 140CF gene will be flanked with the 5' sequence of "TTCAGTCGACGGCCACC" that contains a Kozak" sequence (GCCACCATGG/A) and SalI site and 3' sequence of TAAAGATCTTACAA containing stop codon and BglII site.)

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Fig. 29A

CON OF CON-S-2003 (829 a.a.)

MRVMGIQRNCQHLWRWGILIFGMLIICSAENLWVTYYGVPVWKEANTTLCASDAKAYDTEVHNWVWATHACVPTDPNPQEIVL
 ENVTFENFMWKNMVEQMHEDIISLWDQSLKPCVKLTPLCVTLNCTDVNATNTNNEEIKNCSENIITEIRDKKKVYALFYKL
 DVVPIDDDNNSYRLINCNTSAITQACPKVSFEPIPIHYCAPAGFAILKCNCKKNGTGPKNVSTVQCTHGKIPVSTQLLNGSL
 AEEIIIRSENITNNAKTIIVQLNESVEINCTRPNNTRKSIRIGPGQAFYATGDIIGDIRQAHCNISRTKWNKTLOQVAKKLRE
 HFNKTIIFNPSSGGDLIETHSFNCGGEFFYCNTSELFNSTWNGTNTITLPCRKQIINMWQGVGQAMYPPIEGKIRCTSNIT
 GLLLTRDGGNNNTETFRPGGDMRDNRSELYKYKVVKIEPLGVAPTAKRRVVEREKRAVGIGAVFLGFLGAAGSTMGAASITL
 TVQARQLLSGIVQQSNLLRAIEAQHLLQLTWVGKIQLOARVLAVERYLKDQQLLGWCSGKLICTTNVPWNSSWSNKSQDEI
 WDNMTWMEWDKEINNYTDIIYSLIEESQNOQKEQELLALDKWASLWNWFDITNWLWYIKIFIMIVGGLIGLRIVFAVLISIVNR
 VRQGYSPLSFTLIPNPRGPDREGEIEEGEQDRDRSIRLVNGFLALAWDDLRSLCLFSYHRLDLILIAARTVELLGRRGWEA
 LKYLWNLQYWGQELKNSAISLLDTTAIAVAEGTDRVIEVVRVCRAILNIPRRIRQGFERALL

*Amino acid sequence underlined is the fusion domain that will be deleted in 140CF design and the "W" underlined with red color is the last amino acid at the C terminus, and all the remaining amino acids after the "W" will be deleted in 140CF design.

Fig. 29B

CON-S-2003 140CF.pep (620 a.a.).

Nick name: 006

MRVMGIQRNCQHLWRWGILIFGMLIICSAENLWVTYYGVPVWKEANTTLCASDAKAYDTEVHNWVWATHACVPTDPNPQEIVL
 ENVTFENFMWKNMVEQMHEDIISLWDQSLKPCVKLTPLCVTLNCTDVNATNTNNEEIKNCSENIITEIRDKKKVYALFYKL
 DVVPIDDDNNSYRLINCNTSAITQACPKVSFEPIPIHYCAPAGFAILKCNCKKNGTGPKNVSTVQCTHGKIPVSTQLLNGSL
 AEEIIIRSENITNNAKTIIVQLNESVEINCTRPNNTRKSIRIGPGQAFYATGDIIGDIRQAHCNISRTKWNKTLOQVAKKLRE
 HFNKTIIFNPSSGGDLIETHSFNCGGEFFYCNTSELFNSTWNGTNTITLPCRKQIINMWQGVGQAMYPPIEGKIRCTSNIT
 GLLLTRDGGNNNTETFRPGGDMRDNRSELYKYKVVKIEPLGVAPTAKKTLTVQARQLLSGIVQQSNLLRAIEAQHLLQLTV
 WGKIQLOARVLAVERYLKDQQLLGWCSGKLICTTNVPWNSSWSNKSQDEIWDNMTWMEWDKEINNYTDIIYSLIEESQNOQKEK
 NEQELLALDKWASLWNWFDITNWL*

*Amino acids seen in blue color is for easy identification of the junction of the deleted fusion cleavage site.

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Fig. 29C

CODON-OPTIMIZED CON-S-2003 140CF.seq (1891 nt

Nick name : 006

TTCAGTCGACAGCCACCACATGCGGGTCATGGGGATACAGAGGAATTGCCAGCATTGTGGAGGTGGGAATTTTGATATTCGGGAT
GCTCATAATCTGCTCTGCCGTGAGAACCTGTGGTCACTGTGTATTACGGCGTTCCCGTCTGGAAAGAAGCTAATACTACCCCTG
TTTGTGCAAGCGACGCCAAGCATACGACACCGAAGTCCACAATGTCTGGGTACCCACGCCTGTGTACTACTGATCCAAATC
CCCAGGAAATTGTTCTTGAAAACGTAAACGAAAACCTTAAACATGTGGAAGATAATATGGTGGAGCAATGCACGAGGATATAAT
CAGCCTGTGGACCACTCCCTCAAAACCATGCGTTAAACTCACTCCACTCTGCGTGACTCTGAACCTGTACCGACGTGAACGCAACC
AATAATACAACAACAATGAGGAGATAAAGAAATTGTTCAATTAATAATAACCACTGAGATACGGGATAAGAAAAAAGGTTTATG
CACTCTTTTACAGCTCGACGTGGTGGCCATAGACGACAATAATAGCTACCGACTCATTAATTGCAATAGTAGCGCTATAACCCA
GGCATGCCCCAAAGTTTCTTCGAGCCCATACCGATTCACTACTGCGCACCCGCGGATTGCGCATTTAAATGCAATGACAAG
AAGTTCAACGGCACCGGACCTGTAAAGAACGTAAAGCACTGTTCAATGTACACATGGAATTAAGCCGGTAGTGTCAACGCACTCC
TCCTCAACGGGAAGCCTTGCAAGAAGAGATCATTAATCAGGTCAGAAAATATCACTAACACGCGAAACAATCATTTGTTCAAGCT
GAATGAGTCTGTAGAAATCAATTGTACCCGCCCTAATAATAACACAAGAAAGTCAATTAGGATCGGACCCGGCCAGGCTTCTAC
GCAACCGGAGATATCATCGGGATATACGACAGGCCCACTGCAACATTTCTAGAACTAAGTGAATAAACTTTGCAGCAGGTAG
CCAAGAACTGCGGGACATTTTAATAAGACAATCATCTTCAATCCAAAGTAGCGGAGGGACCTGGAAATCACTACACATTCCCTT
TAAGTGTGGGGCGAGTTTCTACTGTAATACCTCTGAACCTGTTCAACTCAACATGGAATGGCACTAACAACTACTATAACTCTT
CCTTGCAAGATAAACAAGATTATCAACATGTGGCAGGTGTGGGCAAGCAATGTATGCACCACTGAAGGCAAAATAAGAT
GCACCTCCAATATTACCGGACTCCTCCTGACACGGGATGGCGAAACAATAACACGGAGACCTTTAGCCAGCGCGGCGGATAT
GAGAGATAACTGGCGCTCCGAGCTCTATAATAACAAAGTCGTTAAGATCGAGCCCTTGGAGTTGCGCAACCAAGCTAAAAAC
TTGACCGTGCAAGCCAGGCAGTTGTTGTAGGTATCGTACAGCAGCAATCTAATCTTTTGAGAGCCATTGAGGCTCAGCAGCAC
TCTTGCAAGCTTACCGTCTGGGGCATCAAAACAATTGAGGACCGCTCCTGGCGTAGAGCGCTATTGAAAGACCAACTTCT
CGGGATCTGGGGTGTCTGGAAAATTGATCTGCACGACAAATGTGCCTTGGACAGCAGTGGTCAATAAAGCCAAAGACGAA
ATATGGGATAACATGACATGGATGGGATAAAGAAATTAATAATTACACTGACATTAATTTACTCACTTATCGAGGAATCAC
AAAAACAACAGGAAAAAATGAACAGGAACTCTTGGCTCTGGACAAATGGGCTTCACTGTGGAACCTGGTTCGACATCACAAATTG
GCTCTGGTAAAGATCTTACAA

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Fig. 30A

CONSENSUS A1-2003 (845 a.a.)

MRVMGIQRNCQHLLRWGTMILGMIIICSAEENLWVTYYGVVPWKDAETTLFCASDAKAYETEMHNWVATHACVPTDPNPQEIHL
 ENVTEEFNMWKNMVEQMHTDIIISLWDQSLKPCVKLTPLCVTLNCSNVNTNNTTHEEIKNCSFNMTTELDRKKQKVYSLFY
 RLDVVQINENNSNRYRLINCNTSAITQACPKVSFEPIPIHYCAPAGFAILKCKDKEFNGTGPKCNVSTVQCTHGKPKVSTQLL
 LNSLAEEEEVIRSENITNNAKTIIVQLTKPVKINCTRPNNTRKSIRIGPGQAFYATGDIIGDIRQAHCNVSRSEWNKTLOKVA
 KQLRKYFKNKTIIIFTNSSGGDLEITTHSFNCGGEFFCYNTSGLFNSTWNNGTMKNTITLPCRICKQIINMWQRAQAMYPPIQGV
 IRCESNITGLLTRDGGNNNTNETFRPGGDMRDNRSELKYKVVKIEPLGVAPTRAKRRVVEREKRAVGIGAVELGFLGAAGS
 TMGAASITLTQARQLLSGIVQQSNLLRAIEAQHLLKLTVMGKQLQARVLAVERYLKDQQLGIWGCCKLICCTTNVPWNSS
 WSNKSQNEIWDNMTWLQWDKEISNYTHIIYNIIEESONQOEKNEQDLLALDKWANLWNVFDISNWLWYKIFIMIVGGLIGLRIV
 FAVLSVINRVQGYSPLSFQTHTPNPRGLDRPGRIEEGGEQGRDRSIRLVSGFLALAWDDLRSLCLFSYHRLRDFILIAARTVE
 LLGHSSSLKGLRLGWGLKYLWNLWLLYWGRELKISAINLVDTIAIAGWTDRIEIGQRIGRAILHIPRRIRQGLERALL

*Amino acid sequence underlined is the fusion domain that will be deleted in 140CF design, and the "W" underlined with red color is the last amino acid at the C terminus, and all the remaining amino acids after the "W" will be deleted in 140CF design.

Fig. 30B

Con-A1-2003 140CF.pap (629 a.a.)

Nick name: 001

MRVMGIQRNCQHLLRWGTMILGMIIICSAEENLWVTYYGVVPWKDAETTLFCASDAKAYETEMHNWVATHACVPTDPNPQEIHL
 ENVTEEFNMWKNMVEQMHTDIIISLWDQSLKPCVKLTPLCVTLNCSNVNTNNTTHEEIKNCSFNMTTELDRKKQKVYSLFY
 RLDVVQINENNSNRYRLINCNTSAITQACPKVSFEPIPIHYCAPAGFAILKCKDKEFNGTGPKCNVSTVQCTHGKPKVSTQLL
 LNSLAEEEEVIRSENITNNAKTIIVQLTKPVKINCTRPNNTRKSIRIGPGQAFYATGDIIGDIRQAHCNVSRSEWNKTLOKVA
 KQLRKYFKNKTIIIFTNSSGGDLEITTHSFNCGGEFFCYNTSGLFNSTWNNGTMKNTITLPCRICKQIINMWQRAQAMYPPIQGV
 IRCESNITGLLTRDGGNNNTNETFRPGGDMRDNRSELKYKVVKIEPLGVAPTRAKTLTVQARQLLSGIVQQSNLLRAIEA
 QHLLKLTVMGKQLQARVLAVERYLKDQQLGIWGCCKLICCTTNVPWNSSWSNKSQNEIWDNMTWLQWDKEISNYTHIIYNLI
 EESQNOQEKNEQDLLALDKWANLWNVFDISNWLW*

*Amino acids seen in blue color is for easy identification of the junction of the deleted fusion cleavage site.

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Fig. 30C

CODON-OPTIMIZED Con-A1-2003.seq

Nick name: 001 (1918 nt)

TT CAG TCG A CAG C C C A C C A T G A G G G T G A T G G G A A T C C A A C G G A A C T G C C A G C A T C T T C C G G T G G G A A C G A T G A T A C T G G G A A T
G A T A A T A A T C T G C T C T G C C G C T G A A A A C C T C T G G G T C A C A G T G T A C T A C G G A G T G C C T G T A T G A A G A C G C T G A A C C A C T C T C
T T T T G T G C T T C C G A T G C T A A G C C T A C G A A C C G A G A T G C A C A A T G T T G G G C C A C C C A C G C C T G C G T G C C A A C T G A T C C T A A T C
C A C A A G A A T A C A T C T G G A G A A T T T A A C A T G T G G A A A A T A A T A T G T A G A G C A A A T G C A C A C T G A C A T C A T
T T C A C T C T G G A C C A A T C A C T C A A A C C C T G C G T T A A A C T T A C C C C C T C T G C G T G A C C C T C A A T T G T A G C A A C G T C A A C G T C A C A
A A T A A T A C A A C C A C A C T C A C G A G G A A A T T A A A A T T G C T C C T T T A A T A T G A C C A C T G A A C T T C G C G A C A A A A A A C A A A A A G
T C T A T T C A C T G T T T A T A G G T G G A C G T C G T C C A A T C A A C G A G A C A A T T C T A A C A G T A G C T A T C G A C T T A T C A A T T G C A A T A C
C T C T G C T A T T A C C C A A G C T T G T C C T A A A G T C T T T T G A A C C A A T C C C T A T C C A C T A C T G T G C C C A G C T G G A T T C G A A T T C G A A T T C T G
A A G T G C A A G G A T A A G G A A T T C A A C G G A A C T G C C C T T G C A A G A C G T T A G C A C T G T C C A A T G C A C T C A C G G A A T C A A A C C A G T A G
T C A G C A C T C A A C T G C T C C T G A A T G G C T C A C T C G C C G A A G A G G T G A T T A T C C G A A G C G A G A C A T A A C T A A C A A T G C G A G A C
A A T A A T T G T T C A A T T G A C G A A A C C A G T G A A G A T C A A C T G T A C T A G A C C A A T A A C A A C A A G A A A A T C T A T C A G A A T T G G C C C C
G G A C A A G C C T T C T A C G C A A C A G G A G A T A T C A T A G T G A C A T C A G A C A G G C C A T T G C A A C G T T C A G A A G C G A G T G G A A T A A A
C A C T C C A G A A A G T G G C A A G C A G C T G A G A A A T A C T T T A G A A C A A G A C A A T C A T A T T A C T A A C T C C T C G G A G G T G A T C T C G A
A A T A A C C A C T C A T A G C T T T A A T T G T G G G G C G A A T T C T T A C T G T A A C A C A C A T C T G G C C T C T T A A T T C T A C C T G G A A T A A C G G C
A C C A T G A A A A T A C T A T C A C C C T C C C T T G C A G A A T T A A G C A A T C A T T A A C A T G T G C A G A G A C A G A C A G G C C A T G T A T G C C C
C T C C A T T C A A G G T G T G A T T C G A T G T G A A G C A A C A T T A C T G G A C T T C T T G A C C C G G A T G C G G A A T A A A T A A T A C C A A T G A
G A C A T T C A G A C C C G G C G G C G A T A T G C G A G A C A A T T G G C G A A G T G A A C T T A T A A A T A C A A A G T A G T T A A G A T T G A G C C C C T T
G G A G T G C C C C T A C T A G A G C A A A A C A T T G A C C G T T C A G G C C A G G C A G T G C T C T C A G G A A T C G T C A G C A G C A A A G T A A C C T C C
T C C G A G C T A T C G A G G C A C A A C A C A T C T C T T G A A A T T G A C C G T A T G G G A A T C A A G C A A T T G C A G G T A G G G T T T G G C T G T G G A
A C G C T A T C T C A A G A T C A G C A G C T T C T G G A A T C T G G G A T G C T C T G G A A T T G A T A T G T A C T A C A A A C G T A C C C T G G A A C T C A
A G C T G G A G T A A T A A A G C C A G A A C G A A A T T T G G A T A A T A T G A C C T G G C T G C A G T G G A C A A A A A T T T C T A A T T A T A C T C A T A
T C A T A T A C A A T C T G A T C G A A G A A T C A C A G A A C C A G A A A A G A A T G A G C A A G A C C T T C T G G C C T T G G A C A A G T G G G C T A A C T T
G T G G A A C T G G T T G A C A T T A G C A A C T G G C T G T G G T A A A G A T C T T A C A A

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Fig. 31A

CONSENSUS C-2003 (835 a.a.)

MRVGRILRNCCQWIIWGILGFWMMLMCNVVGNLWVTYYGVVPWKEAKTTLFCASDAKAYEKEVHNWVWATHACVPTDPNPQEIVL
 ENVTFENFMWKNMDVDMQMHEDIISLWDQSLKPCVKLTPLCVTLNCTNATNTMGEIKNCSEFNITTELDRKKQKVYALFYRLDI
 VPLNENNSYRLINCNSTSAITQACPKVSEDPPIPIHYCAPAGYAILKCNKNTFNGTGPCNNVSTVQCTHGKIPVSTQLLNGSLAE
 EEIIIRSENLTNNAKTIIVHLNESVEIVCTRPNNNTRKSIRIGPGQTFYATGDIIGDIRQAHCNISEDKNKNTLQKVSKKLKEHF
 PNKTIKFEPSGGDLEITTHSFNCRCGEFFCYNTSKLFNSTYNSTNSTITLPCRICKQIINMWQEVGRAMYAPPIAGNITCKSNITG
 LLLTRDGGKNNNTETFRPGGDMRDNRSELYKYKVVEIKPLGIAPTAKRRVVEREKRAVGIGAVFLGFLGAAGSTMGAASITLT
 VQARQLLSGIVQQSNLLRAIEAQQHMLQLTVWGIKQLQTRVLAIERYLKDQQLIGWCSGKLICTTAVPWNSSWSNKSQEDIW
 DNMTWMQWDREISNYTDTIYRLLEDSONQQEKNKDLALDSWKNLWNWEDITNWLWYIKIFIMIVGGLIGLRIFAVLSIVNRV
 RQGYSPLSFQTLTPNPRGPDRLGRIEEEGEGQDRDSIRLVSGFLALAWDDLRLSLCLFSYHRLRDFILIAARAVELLGRSSLRGL
 QRGWEALKYLGSLVQYWGLELKKSAISLDDTIAIAVAEGTDRIIELIQICRAIRNIPRRIRQGFEEALQ

*Amino acid sequence underlined is the fusion domain that will be deleted in 140CF
 design and the "W" underlined with red color is the last amino acid at the C
 terminus, and all the remaining amino acids after the "W" will be deleted in 140CF
 design..

Fig. 31B

Con-C 2003 140CF.pap (619 a.a.)

Nick name: 003

MRVGRILRNCCQWIIWGILGFWMMLMCNVVGNLWVTYYGVVPWKEAKTTLFCASDAKAYEKEVHNWVWATHACVPTDPNPQEIVL
 ENVTFENFMWKNMDVDMQMHEDIISLWDQSLKPCVKLTPLCVTLNCTNATNTMGEIKNCSEFNITTELDRKKQKVYALFYRLDI
 VPLNENNSYRLINCNSTSAITQACPKVSEDPPIPIHYCAPAGYAILKCNKNTFNGTGPCNNVSTVQCTHGKIPVSTQLLNGSLAE
 EEIIIRSENLTNNAKTIIVHLNESVEIVCTRPNNNTRKSIRIGPGQTFYATGDIIGDIRQAHCNISEDKNKNTLQKVSKKLKEHF
 PNKTIKFEPSGGDLEITTHSFNCRCGEFFCYNTSKLFNSTYNSTNSTITLPCRICKQIINMWQEVGRAMYAPPIAGNITCKSNITG
 LLLTRDGGKNNNTETFRPGGDMRDNRSELYKYKVVEIKPLGIAPTAKTLTVQARQLLSGIVQQSNLLRAIEAQQHMLQLTVW
 GIKQLQTRVLAIERYLKDQQLIGWCSGKLICTTAVPWNSSWSNKSQEDIWDMTWMQWDREISNYTDTIYRLLEDSONQQEKN
 EKDLLALDSWKNLWNWEDITNWLW*

*Amino acids seen in blue color is for easy identification of the junction of the
 deleted fusion cleavage site.

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Fig. 31C

CODON-OPTIMIZED Con-C-2003 140CF (1,888 nt.)

Nick name:003

TTCAGTCGACAGCCACCATGCGAGTGAGAGGCCATTCTGCGGAATTGTCAGCAATGGTGGATCTGGGGCATACTCGGATTCTGGAT
GCTTATGATATGCAATGTTGTGGGAACCTGTGGGTACCGTATACCTATATGGGTTCCAGTCTGGAAGAGGCTAAACAACACGCTG
TTCTGTGCAAGTGACGCCCAAGCCTACGAGAAAGAGTGCACAACGCTCTGGGCTACCCACGCTGTGTGTTCCAACCGATCCAAACC
CCCAGGAAATCGTCTCGAGAACGCTGACTGAAAACCTTTAACATGTGGAGAATGATATGGTAGATCAGATGCACGAAGATATCAT
TTCAATTGTGGACCAATCATTTGAAACCATGCGTAAACTGACCCCCCTCTGCGTAACACTTAAGTGCACCAATGCAACTAAATGCC
ACCAATACTATGGCGAAATAAAAACTGTAGCTTTAACATTACAACGGAATCCGGGATAAGAAACAAAGGTCTACGGCTCT
TTTACCGACTCGATATCGTCCCACTTAACGAGAAATAAGTTACCGCTGATTAACTGTAACACATCAGCCATTACGCAAGCTTG
CCCCAAAGTTCTTTCGACCCCATCCCAATTCACTATTGTGCCCCCGCTGGATACGCTATACCTAAATGCAACAATAAAACATTT
AATGGAACCGGACCATGTAAACAACGTCAGTACCGTACAATGTACGACGGAATTAACCTGTGTCTCAACCCAGCTTCTCCTTA
ACGGCTCATTTGGCGGAGGAAGAAATTATTATCAGATCAGAAACTTGACCAACAATGCCAAACCATCTGTCAACCCAGCTTCAATGA
ATCCGTGGAATCGTGTGCCACGAGACCAATAAACAATACCCGGAATCAATCAGGATTGGGCTGGCCAGACATTTTACGCTACA
GGTGATATAATTGGCGATATTAGACAAAGCCATTGCAACATATCAGAAAGACAAGTGGAATAAGACTCTGCAGAAAGTTTCTAAGA
AGCTGAAGGAACACTTCCCAATAAAACGATTAAAGTTCGAGCCCTCTTCAGGAGGAGACCTTGAGATCAACAACACTCTTTTAA
TTGTAGAGGGGAGTTCTTCTATTGTAAATACATCAAGCTCTTAAACAGTACCTACAACCTCCACTAATAGTACCATCACACTCCC
TGCAGAAATAAGCAATAATAACAACATGTGGCAAGAGTTGGCGGAGCAATGTAAGCCCCCTCCCATCGCAGGCAACATTACATGTA
AATCCAATATTACTGGCCTTTTGTGACACGGGACGGGAAAGATAACACTGAGACCTTCAGACCTGGCGGAGCGGATATGCG
CGATAATTGGCGGAGCGAGCTCTACAAGTATAAAGTCGTTGAATCAAGCCACTGGGCATAGCTCCTACGAAAGCAAAGACACTC
ACTGTTACGGCTAGACAGCTGCTCTCCGGCATAGTGCAACAGCAATCCAATCTCCTGCGAGCTATCGAAGCCCAACAATATGC
TCCAGCTTACCGTCTGGGGAATCAACAATGCAACACGAGTGTGGCGATAGAGAGATATTTGAAAGATCAGCAACTCCTGGG
GATTGGGGCTGTTCAGGTAAGCTCATCTGTACAACCTGCGGTGCGGTAAGCTGAGTAAACAAGCCAAAGAGGATATA
TGGGACAACATGACTTGGATGCAGTGGGATCGAGAAATAAGCAACTATACAGATACCATTTATCGGCTCCTGGAGGACTCACAGA
ACCAGCAGGAGAAATAAGAAAGATTGCTCGCGCTTGACAGTTGGAAGAAATTTGTGGAATTGGTTCGACATTACAAACTGGCT
CTGGTAAAGATCTTACAA

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Fig. 32A

CONSENSUS G-2003 (842 a.a.)

MRVKGIGQRNWQHLLWKWGTLLILGLVICSASNLLWVTYYGVVWEDADTTLFCASDAKAYSTERHNWATHACVPTDPNPQEITL
 ENVTFENFMWKNMVEQMHEDIISLWDESLKPCVKLTPLCVTLNCTDVNTNNTNNTKKEIKNCSEFNITTEIRDKKKKEYALFY
 RLDVVPINDNGNSSIYRLINCNVSTIKQACPKVTFDPIPIHYCAPAGFAILKCRDKKFNCTGPKCNVSTVQCTHGKPKVSTQLL
 LNSLAEEEEIIIRSENITDNTKVIIVQLNETIEINCTRPNNTRKSIRIGPGQAFYATGDIIGDIRQAHNCNVSRTKWNEMLQKVK
 AQLKKIFNKSIITFNSSSGGDLITTHSFNCRGEFFYCNTSGLFNSSLNSTITLPCIKQIVRMWQVRVQAMYPPIAGNIT
 CRSNITGLLLTRDGGNNNTETFRPGGDMRDNRSELYKYIKVPLGVAPTRARRRVEREKRAVGLGAVLLGFLGAAGSTMG
 AASITLTVQVRQLSGIVQQSNLLRAIEAQHLLQLTVMGIKQLQARVLAVERYLKDQQLGIWGCSEGLICTTNVPWNTSWSN
 KSYNEIWDNMTWIEWEREISNYTQIYSLIEESQNOQEKNEQDALLALDKWASLWNWFDITKWLWYIKIFIMIVGGLIGLRIVFAV
 LSIVNRVRQGYSPSLFTLTHHQREPDRIEIEGGGEQDKDRSIRLVSGFLALAWDDLRLSLCLFSYHRLRDFILIAARTVELLG
 RSSLKGLRLGWEGLKYLWLLLYWGQELKNSAINLLDTIAAVANWTDRIEVAQRAILNIPRRIRQGLERALL

*Amino acid sequence underlined is the fusion domain that will be deleted in 140CF design and the "W" underlined with red color is the last amino acid at the C terminus, and all the remaining amino acids after the "W" will be deleted in 140CF design.

Fig. 32B

Con-G-2003 140CF (626 a.a.)

Nick name: 007

MRVKGIGQRNWQHLLWKWGTLLILGLVICSASNLLWVTYYGVVWEDADTTLFCASDAKAYSTERHNWATHACVPTDPNPQEITL
 ENVTFENFMWKNMVEQMHEDIISLWDESLKPCVKLTPLCVTLNCTDVNTNNTNNTKKEIKNCSEFNITTEIRDKKKKEYALFY
 RLDVVPINDNGNSSIYRLINCNVSTIKQACPKVTFDPIPIHYCAPAGFAILKCRDKKFNCTGPKCNVSTVQCTHGKPKVSTQLL
 LNSLAEEEEIIIRSENITDNTKVIIVQLNETIEINCTRPNNTRKSIRIGPGQAFYATGDIIGDIRQAHNCNVSRTKWNEMLQKVK
 AQLKKIFNKSIITFNSSSGGDLITTHSFNCRGEFFYCNTSGLFNSSLNSTITLPCIKQIVRMWQVRVQAMYPPIAGNIT
 CRSNITGLLLTRDGGNNNTETFRPGGDMRDNRSELYKYIKVPLGVAPTRARRRVEREKRAVGLGAVLLGFLGAAGSTMG
 LLQLTWVGIKQLQARVLAVERYLKDQQLGIWGCSEGLICTTNVPWNTSWSNKSYNEIWDNMTWIEWEREISNYTQIYSLIEES
 QNOQEKNEQDALLALDKWASLWNWFDITKWLW*

*Amino acids seen in blue color is for easy identification of the junction of the deleted fusion cleavage site

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Fig. 32C

CODON-OPTIMIZED Con-G-2003 140CF.seq

Nick name:007

TTCAGTCGACAGCCACCATGCGAGTGAAGGAATCCAGAGAAATGGCAGCACCTTTGGAAGTGGGGCACACTCATCCTCGGCCT
TGTGATCATATGCTCTGCTCAAAATAACCTTTGGTCACAGTTTATTACGGCGTGCCCGTTTGGAGGACGACACAACTCTT
TTTGTGCCAGCGCTAAGGCTTATTCAACAGAGAGGCATAACGTTTGGGTACACATGCATGCGTGCCGACCGATCCTAATC
CCCAGGAAATCACTCTTGAGAAATGTTACAGAGAAATTTAATAATGTGGAAGAACAAATGTTGAACAGATGCATGAAGACATAAT
TTCCTCTGGGATGAATCTCTGAAACCTTGCGTGAAGCTTACACCACTGTGCGTTACCTGAATTGCATGACGTCAATGTGCACA
AATAATAATACCAACAATACAAATAAAGAAATCAAAAATGTTCTTCAACATAACCCAGAGATACGGATAAAAAAGAAAG
AATACGCCCTGTTCTACAGACTCGATGTGGTCCCAATTAATGACAAACGGAATTTCTCCATCTACCGACTTATCAATTTGAACGT
GTCTACAATCAACAGGCTGTCTAAAGTCACATTTGACCCCTATTCCCATTCATTACTGTGCCCCCGTGGCTTCGCTATTCTT
AATGCCGAGACAAAATTTAACGGAACAGGACCATGCAAGATGTCTCAACAGTTCAATGCATCATGGAATTAACCCAGTCG
TTTCTACTCAACTCCTTCTCAATGGAAGCCTGGCAGAGAGGAATCATAATCCGAGCGAAACATAACCGACACACAAAGT
AATCATCGTACAGCTGAACGAGACCATTGAATAAATTTGACGAGACCTAATAAACAAGAAAGCATACGCATCGGCCCC
GGACAGGCTTCTACGCCACAGGAGACATTAACGAGATATCCGCCAGGCTCACTGTAATGTGTCTAGAACAAATGGAACGAAA
TGCTTCAGAGGTCAAAGCTCAGCTCAAGAAATATTCAACAAATCTATTCACTCACTCATCATCAGGCGCGATCTGGAGAT
AACAACTCATCTCTCAACTGTCTGGGAGAAATTTTCTACTGTACACGTCCGGCTGTCAACAATTCCTCTGAAATAGCACT
AACTCCACCATCACTCTCCCATGTAGATCAACAAATCGTCAGAAATGTGGCAGCGAGTCGGTCAAGCTATGTACGCCCTCCAA
TCGCCGGTAATATCACATGTAGAAGCAATATCACAGGCTCTTGCTTACAAGGACGGGGAACAACAACCCGAAACCTTCAG
ACCAGGAGGAGGAGACATGCGAGACAATTTGGCGGAGCGAGCTGTATAAATATAAGATCGTAAAAATCAACCCATTGGGTGTAGCG
CCAACTAGAGCCCCGAACTGACCGTGAGGCACTGTGAGCGGCACTGTCCAACAACAATCCAATCTTCTTAGAGCAA
TCGAGGCCCCAGCAGCATCTGCTCCAGCTTACTGTATGGGAATCAACAACCTGCAAGCAAGATTTGGCAGTGGAGAGGTATCT
CAAGGACCAGCAGCTTCTGGGAATTTGGGTTGCAGCGGAAAGCTCATATGTACAACCAATGTGCCCTGGAACACTAGTTGGAGT
AATAAGATTACAATGAATCTGGGACAATATGACATGGATCGAATGGGAGCGGAAATATCCAACCTATCTCAGCAAAATCTATT
CCCTCATTTGAAGAGAGTCAGAAACGAGGAAAGAAATGAGCAAGACCTCTCGCCCTGGATAAATGGGCATCTCTGTGGAACCTG
GTTTGACATAACTAAATGGTTGTGGTAAAGATCTTACAA

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Fig. 33A

CONSENSUS_01 AE-2003 (854 a.a.)

MRVKETQMNWPNLWKWGTLILGLVICSASDNLWVTYYGVVWRDADTTLCASDAKAHETEVEHNVWATHACVPTDPNPQEIHL
 ENVTFENFMWKNMVEQMQEDVISLWDQSLKPCVKLTPLCVTLNCTNANLTNNITNVSNIIGNITNEVRNCSFNMTTTELDRDKK
 QKVHALFYKLDIVQIEDNNSYRLINCNTSVIKQACPKISFDPIPIHYCTPAGYAILKCNDFNGTGPCKNVSSVQCTHGKIPVV
 STQLLLNGSLAEIEIIIRSENLTNNAKTIIIVHLNKSVEINCTRPSNNTRTSITIGPGQVFYRTGDIIGDIRKAYCEINGTKWNEV
 LKQVTEKLKEHFNNKTIIFQPPSGGDLEITMHHFNCRGEFFYCNTTKLFNNTCIGNETMEGCNGTIIILPCKIKQIINMWQAGQA
 MYAPPISGRINCVSNTIGILLTRDGGANNTEFRPGGNIKDNWRSELYKYKVQVIEPLGIAPTRAKRRVVEREKRAVGIGAMI
 FGFLGAAGSTMGAASITLTVOARQLLSGIVQQSNLLRAIEAQHLLQLTVWGIKQLQARVLAVERYLKDQKFLGLWGCSGKIIC
 TTAVPWNSTWSNRSEIEIWNMTWIEWEREISNTYNTQIYEILTESQOQDRNEKDLELDKWLWTFDITNWLWYIKIFIMIV
 GGLIGLRIFIIFAVLSIVNRVQGYSPLSFQTPTHHQREPDPERIEEGGEGQGRDRSVRLVSGFLALAWDDLRLSLCLFSYHRLRDF
 ILIAARTVELLGHSSKGLRRGWGLKYLGNLLYWGQELKISAILSLDATAIAVAGWTDRIEVAQGAWRAILHIPRRIRQGLE
 RALL

*Amino acid sequence underlined is the fusion domain that will be deleted in 140CF design and the "W" underlined with red color is the last amino acid at the C terminus, and all the remaining amino acids after the "W" will be deleted as 140CF.

Fig. 33B

Con-AE01-2003 140CF.pap (638 a.a.)

Nick name: 008

MRVKETQMNWPNLWKWGTLILGLVICSASDNLWVTYYGVVWRDADTTLCASDAKAHETEVEHNVWATHACVPTDPNPQEIHL
 ENVTFENFMWKNMVEQMQEDVISLWDQSLKPCVKLTPLCVTLNCTNANLTNNITNVSNIIGNITNEVRNCSFNMTTTELDRDKK
 QKVHALFYKLDIVQIEDNNSYRLINCNTSVIKQACPKISFDPIPIHYCTPAGYAILKCNDFNGTGPCKNVSSVQCTHGKIPVV
 STQLLLNGSLAEIEIIIRSENLTNNAKTIIIVHLNKSVEINCTRPSNNTRTSITIGPGQVFYRTGDIIGDIRKAYCEINGTKWNEV
 LKQVTEKLKEHFNNKTIIFQPPSGGDLEITMHHFNCRGEFFYCNTTKLFNNTCIGNETMEGCNGTIIILPCKIKQIINMWQAGQA
 MYAPPISGRINCVSNTIGILLTRDGGANNTEFRPGGNIKDNWRSELYKYKVQVIEPLGIAPTRAKTLTVQARQLLSGIVQQQ
 SNLLRAIEAQHLLQLTVWGIKQLQARVLAVERYLKDQKFLGLWGCSGKIICTTAVPWNSTWSNRSEIEIWNMTWIEWEREISN
 YTNQIYEILTESQOQDRNEKDLELDKWLWTFDITNWLW*

*Amino acids seen in blue color is for easy identification of the junction of the deleted fusion cleavage site.

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Fig. 33C

CODON-OPTIMIZED Con-AE01-2003 140CF.seq (1945 nt.)

Nick name: 008

ttcagtcgacagccaccatgCGAGTCAAGGAAACACAAATGAACCTGACCTAATCTGTGGAAGTGGGGCACCCCTGATCCTGGGTTT
GGTCATTATTTGCTCTGCGAGCGACAATCTCTGGTTACTGTCTATTACGGAGTCCCCGTTTGGAGAGATGCCGACACTACACTG
TTCTGCGCCTCAGATGCCAAAGCTCATGAACCTGAAGTGCATAATGTTTGGGCAACCCACGCTGTGTTCTTACCGACCCCAACC
CCCAAGAAATACACCTTGAAACCGTGACCGAGAACTTTAATATGTGGAAGAATAACATGGTTGAACAGATGCAAGAAGACGTAAT
CAGCCTGTGGGATCAAGTCTGAACCTTGCGTAAACCTGACTCCACTTTCGCTAACACTTAATTGCACCAACGCGAACCTTGACA
AACGTTAACACATCACTAACGTTCTCCACATCATCGGCAACATAACGAACGAAGTGAATAATGCGAGTTTCAATATGACTACAG
AGCTCCGGGACAAGAACAGAGGTCCTCTCTTTTACAACTCGACATCGTCCAGATCGAAGACAATAACAGCTACAGACT
TATAAATTGTAATACATCCGTGATTAAACAAGCATGCCCAAAATAAGCTTCGATCCTATTCCTATCCACTACTGTACTCCTGCC
GGCTATGCTATCTTGAAATGCAATGATAAGAACTTCAATGGGACCGGACCTTGTAAGAACGTGTCTAGTGTGCAATGCACTCAGG
GCATTAAACCGTAAAGTAAAGCACCAGCTGCTCTGAACGGCTCTCTGGCAGAGGAAGAGATTATTATTCGAAAGTGAGAACCTCAC
CAACAACGCTAAGACTATCATCGTACATCTCAATAAATCAGTCGAAATTAATTGCACCGAGACCCCTCCAATAATACTAGAACTTCA
ATCACTATCGGCCAGGACAAGTCTTTTATAGAACAGGAGATATCAGAGAGATATCAGAAAGGCATATTGCGAGATAAACGGGA
CAAAATGGAACGAAGTACTCAAAACAAGTCACAGAGAAGCTTAAGGAAACATTTCAACAATAAAACCATTTATTTCAACCCCAAG
TGGCGGAGACCTCGAAATCACTATGCACCACTTCAACTGCGCGGCGAATTTTATTGCAATACCACTAAACTTTTCAACAAT
ACGTGCATCGGAAATGAGACCATGGAGGCTGCAATGGAAACAATCATCTCCCATGCAAGATAAAACAATCATTAACATGTGGC
AAGGTGCTGGACAAGCTATGTATGCACCCCAATATCCGGTAGAATTAATTGCGTCAGCAACATCACTGGCATACTGCTCACTAG
AGACGGAGGAGCAAAATAATACAAATGAACATTCGACCAAGGCGGCAACATTAAGGACAACCTGGCGGTCGGAACCTTATAAG
TACAAAGTCGTACAGATCGAACCTCTTTGGAATAGCACCGACTCGCGCTAAGACACTCACAGTACAGGCCCGACAACCTTCTTCTG
GAATCGTACAGCAATCCAACTCCTCCGCGCAATCGAGGCCCAACAACATCTGCTTCAGCTCACAGTTTGGGGAATCAAGCA
GCTCCAGGCACGCGTCTCGCAGTGGAAAGATACCTGAAGATCAGAAATTCCTTGGTCTCTGGGATGTTCTGGCAAAATAATC
TGCACACCGCGGTTCCCTGGAATCAACATGGAGCAACCGGAGTTTGAAGAGATATGGAACAATATGACATGGATAGAGTGGG
AAAGGAAATTAGTAACATATACGAACCCAGATATACGAATCCTCACCGAAAGCCAAATCAGCAGGATCGCAACGAAAAAGACCT
CCTCGAGCTTGATAAGTGGGCATCCCTTTGGAACTGGTTCGACATCACAAATTGGCTCTGGtaagatcttataa

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Fig. 34A

Wild-type subtype A Env**00KE_MSA4076-A (Subtype A, 891 a.a).**

MGAMGIQMNWQNLWRWGTMI^{IL}GLMLII^{CS}VAEKSWVT^{YY}GV^{PV}WRDAET^{TL}FCASDAKAHDKEVHN^{VW}ATHACVPTDPNPQEMIL
 ENVTEDFNMWKNSMVEQ^MHTDII^{SL}WDQSLKPCVK^{LT}PLCV^{TL}NCSDSNITSNSTKDSAT^{LD}MKSEIQNCSEFNM^{TT}ELRDK
 KQKVSLFYRLDVVQINENSSDYRLINCNTSAITQACPKVTFEPIPIHYCAPAGFAILK^{CND}KKFNGTGPCTNVSTVQCTHG^{IK}P
 VVTQ^{LL}NGSLAE^{EE}VMIRSENITENAKNII^{VQ}FKEPVQII^{CIR}PGN^{TR}KSVHIGPGQAFYATGDIIGDIRQAH^{CNV}SRELWN
 KTLQEVATQ^{LR}KHFRNNTKII^{FT}NSSGGDVEITTHSFNCGGEFFYCDTSGLFNSSWTASNDSMQEAHSTESNITLQCR^{IK}QII^{IN}M
 WQ^RAGQAMYAPPIPGIIRCESNITGLILTRDGGEGNNSTNETFRPVG^{NMR}DN^{WR}SELYKYK^{VV}KVEPLGVAPT^{KSR}RRVVEREK
 RAVGLGAVFIGELGAAGSTMGAASMTLT^{VQ}ARQLLSGIVQ^{QS}NLLRAIEAQ^{QH}LLKLT^{VG}IKQLQARVLAVERY^{LR}DQQLLGI
WGCSGKLICT^{TN}VP^{WN}SSWSN^{KS}LD^{EI}WENMT^{WM}QWDKEVSNYTMIYNLL^{ES}Q^QKE^{NE}QELLALDKWANL^{WN}FNISN^{WL}W
 YIKIFIMIVGGLIGLRIVFAVLSVINRV^{RQ}GSPLSFQHT^{PN}PRGLDRPGRI^{EE}EGEGQDRDRSIRLVSGFLA^{WD}DL^{RS}LCI
 FSYHRLRDFILIAARTLELLGHNSL^{KL}RGWEG^{LY}LWLLAYWGRELKIS^{AI}SLVDSIAIAVAGWTDRI^{IE}IVQAI^{GR}AILHI
 PRRIRQGLERALI.

*Amino acid sequence underlined is the fusion domain that will be deleted in 140CF design and the "W" underlined with red color is the last amino acid at the C terminus, and all the remaining amino acids after the "W" will be deleted in 140CF design.

Fig. 34B

00KE_MSA4076-A 140CF.pep (647 a.a)**Nick name: 011**

MGAMGIQMNWQNLWRWGTMI^{IL}GLMLII^{CS}VAEKSWVT^{YY}GV^{PV}WRDAET^{TL}FCASDAKAHDKEVHN^{VW}ATHACVPTDPNPQEMIL
 ENVTEDFNMWKNSMVEQ^MHTDII^{SL}WDQSLKPCVK^{LT}PLCV^{TL}NCSDSNITSNSTKDSAT^{LD}MKSEIQNCSEFNM^{TT}ELRDK
 KQKVSLFYRLDVVQINENSSDYRLINCNTSAITQACPKVTFEPIPIHYCAPAGFAILK^{CND}KKFNGTGPCTNVSTVQCTHG^{IK}P
 VVTQ^{LL}NGSLAE^{EE}VMIRSENITENAKNII^{VQ}FKEPVQII^{CIR}PGN^{TR}KSVHIGPGQAFYATGDIIGDIRQAH^{CNV}SRELWN
 KTLQEVATQ^{LR}KHFRNNTKII^{FT}NSSGGDVEITTHSFNCGGEFFYCDTSGLFNSSWTASNDSMQEAHSTESNITLQCR^{IK}QII^{IN}M
 WQ^RAGQAMYAPPIPGIIRCESNITGLILTRDGGEGNNSTNETFRPVG^{NMR}DN^{WR}SELYKYK^{VV}KVEPLGVAPT^{KSR}TL^{TV}QARQ
LLSGIVQ^{QS}NLLRAIEAQ^{QH}LLKLT^{VG}IKQLQARVLAVERY^{LR}DQQLLGWCGSGKLICT^{TN}VP^{WN}SSWSN^{KS}LD^{EI}WENMT^{WM}
QWDKEVSNYTMIYNLL^{ES}Q^QKE^{NE}QELLALDKWANL^{WN}FNISN^{WL}W*

*Amino acids seen in blue color is for easy identification of the junction of the deleted fusion cleavage site.

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Fig. 34C

CODON-OPTIMIZED 00KE_MSA4076-A 140CF.seq (1972 nt.)

Nick name: 011

ttcagtcgacagccaccatgggggcaatgggaatccagatgaaactggcagaacccctctggcgatggggcacaatgatcctgggtat
gctcatcatctgctctgttgagaaaaagtcattggtaacagctactacggcgctaccagtgctggcgagacgcccgaaccactctc
ttctggcctccgatgccaaagcacacgataaagaagtcacacaattgttgggctacccatgctgctgcccacccgataccttaac
cacaagaaatgatactcgaaaacgcttactgaagacttcaacatgtggaataattctatggtgaacagatgcacccgacataat
atcactgtgggatcagctctctcaaacctgtgtcaaatggacccccctctgctgttacactgaactgttccgactcaaatatcact
tctaattcaacgagcaatagtagcaaaccttgcacaccccttgatatgaaaagcgaatacagaactgttcatttaatatgacca
ccgaactgagagataaaaagcagaaggtttattctctgttctatcgattggacgtggttcagatttaacgaaaatagcagcgattt
ccgactcattaactgcaatcacatcagcaatcacacaggttgccccaaagtaacatttgagccaatccctatttactactgctgccc
cctgcaggatttgccatccctgaaatgcaacgataagaagttaattgggacaggacccctgcaccaacgctctccacccgtgcaatgca
cccacggcataaaaacctgtgttacacacaaattgctgctcaatggatcacttgcctgaagaggaagtcattgattcggctctgaaa
catcactgaaaatgccaaaataattatagttcagttcaaaagacccctccagatcatttgcatcgccttggtaacacactcgc
aagtcagtgccacattgggccccggcaggctttctatgcaacggagataattatagcgacatcagacagccacattgcaacgtca
gccccgaattgtggaacaaaactttgcaggaagtgtgctactcagctgcgaaaacatttcagaaaacatacaaaagattattttcac
taattcatcagcgggtgacgtggagatcactaccattcatttaactgtggcgagaattcttctattgggatacctctgggctc
tttaattcctcatggactgctagcaacgattcaatgcaagaagcacattccacagaaaagtaatatcacactgcagtgccgaaatta
aacaaatcatcaatattgtggcagcggcgccggtcaagcaatgtacgcacctcccattccccggaattatttcgattgtgactaatat
cactggcctcattctgacccgagacggtggcgaaggttaataattctcaaacgagactttcagacccctaggaggaataatgcga
gacaattggcgatccgaactgtataataataaagtgtgaagtagaacctcttgagtgccaccccacaaatcacgaacccctga
ctgtgcaggcagccaaactctgagcgggaatagtcacacagcaatccaattcttgagactatagagccacagcaacacctgct
taaaacttacgggtgtgggaatcaaaacaattgcagcgaagagtgctggcagtggaacgatacttgagagaccacaactcctggga
atctggggatgttccggtaagtgtatttgacgacaaaacgttccctggaaactcttctgtgtaaacagagcttgacgcaaatat
gggaaaatatgacatggatgcagtgggacaaggaaattagcaactatacacagatgatctacaacctctcgaagaatctcagaa
tcaacaggaataaaaacgaacaaagaaactgctcgccccctcgataagtgggctaaacctctggaaactggtttaatatattcaaaactggtg
TGGtaaaagatcttataa

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Fig. 35A

Wild-type subtype B

QH0515.1g gp160 (861a.a)

MRVKEIRRNQCRLRRWGTMLLGMLMICSATEQLWVTYVYGVVWKEATTLFCASDAKAYVTEKHNWATHACVPTDPNPQEVVL
 ENVTEFNFMWKNMVEOMHEDIISLWEQSLKPCVKLTPLCVTLNCTDKLRNDTSGTNSSSWEKVQGEIKNCSEFNITTGIRGRVQ
 EYSLFYKLDVIPIDSRNNSNSTEFSSYRLISCVITQACPKISFEPIPIHYCAPAGFAILKCNDDKFNCTGPKCNVSTVQCT
 HGKIPVSTQLLNGSLAEEVIRSENFTNNVKSIIIVQLNKSVINCTRPNNNTRKSIHIGAGKALYTGEIIGDIRQAHCNLSR
 AQWNTLTKQIVIKLREQFGNKTIVFNQSSGGDVEIVMHSFNCGGEFFYCNSSTQLFNSTWNGNDTWNDTWKDTTNDNITLPCRIRKQ
 IVNMWQVKGKAMYAPPPIRGQIRCSSKITGLILTRDGGTNGTNETETFRPGGNMKNDRSELYKYKVVKIEPLGIAPTAKARRV
 QREKRAVGTIGAMFLGELGAAGSTMGAASLTITVQARLLLSGIVQQNNLLRAIEAQOHLQLTVWGIKQLQARVLAVERYLRDQ
 QLLGIWGCSSGRLLCTTNVPWNTSWSNRSLNYIWDNMTWQWDREINNYTDYIYTLLEDAQNQOEKNEQELLELDKWASLWNVFDI
 TNWLWYIKIFIMIVGGLIGLRIVFAVLSIVNRVROGYSPLSQTHLPARRGPDPRPEGIGEGGERDRDRSVRLVHGFLALVWEDL
 RSLCLFSYHRLRDLILLIVARTVEILQGRGWEALKYWNWLLYWSLELKNASVSLVDTIAIAVAEGTDRIEIAARRIFRAFLHIPT
 RIRQGLERALL

*Amino acid sequence underlined is the fusion domain that will be deleted in 140CF design and the "W" underlined with red color is the last amino acid at the C terminus, and all the remaining amino acids after the "W" will be deleted in 140CF design

Fig. 35B

QH0515.1g 140CF (651a.a)

Nick name: 012

MRVKEIRRNQCRLRRWGTMLLGMLMICSATEQLWVTYVYGVVWKEATTLFCASDAKAYVTEKHNWATHACVPTDPNPQEVVL
 ENVTEFNFMWKNMVEOMHEDIISLWEQSLKPCVKLTPLCVTLNCTDKLRNDTSGTNSSSWEKVQGEIKNCSEFNITTGIRGRVQ
 EYSLFYKLDVIPIDSRNNSNSTEFSSYRLISCVITQACPKISFEPIPIHYCAPAGFAILKCNDDKFNCTGPKCNVSTVQCT
 HGKIPVSTQLLNGSLAEEVIRSENFTNNVKSIIIVQLNKSVINCTRPNNNTRKSIHIGAGKALYTGEIIGDIRQAHCNLSR
 AQWNTLTKQIVIKLREQFGNKTIVFNQSSGGDVEIVMHSFNCGGEFFYCNSSTQLFNSTWNGNDTWNDTWKDTTNDNITLPCRIRKQ
 IVNMWQVKGKAMYAPPPIRGQIRCSSKITGLILTRDGGTNGTNETETFRPGGNMKNDRSELYKYKVVKIEPLGIAPTAKAKTLTV
 QARLLSGIVQQNNLLRAIEAQOHLQLTVWGIKQLQARVLAVERYLRDQQLLGIWGCSSGRLLCTTNVPWNTSWSNRSLNYIWD
 NMTWQWDREINNYTDYIYTLLEDAQNQOEKNEQELLELDKWASLWNVFDTNWLW*

*Amino acids seen in blue color is for easy identification of the junction of the deleted fusion cleavage site.

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Fig. 35C

CODON-OPTIMIZED QH0515.1g 140CF.seq (1984 nt.)

Nick name:012

ttcagtcgacagccaccatgagagtaaaagaaatcagacgcaactgtcagaggttgaggagatgggaaacgatgctcctgggcat
gctgatgatttgcagtgccaccgaaacagctttgggtaaaccgtgtactatgtgtgtacctgtatgaaagaaagccactacaacccctg
ttttggcggtccgacgcaaaagcctacgtaaacagaaaagcacaacgtgtgggcccacacatgcattggtgccaacagatcccaatc
ctcaggaagtctgttggaataatgtacagaaaattttaatatgtggaataacaaatattgtagagcagatgcataagatatcat
ctacatgtgggaacaaatcccttgaaaccttgtgtcaaaactgaccccaactttgctgttaacacttaactgataagcttcgcaat
gatacgtccgggaacaaattcaagcagctgggaaaagtgcaaaaggcggaatcaaaaattgttcatttaacatcactaccggta
tcagagggcggtacaggaatatctctttttacaaactcgcagctcatcccaatcgaactccagaaaataactcaataatagcac
agaatttagttagttatcgccctataagctgcaaacaccagcgtgattacacaagcgtgcccataaaatctctttgagcccatctcct
attcactactgcgacaccagccgcttcgcccattcctcaaatgtacagacaaagaaatttaacggaaacccgacccctgtgaagattgtgt
ccaccgttcaatgcactcatggaatcaagcccgctgtttctacccaacttcttcaatggtagcccttgggaggaggaattgtgt
gattcgctccgaaaattttacaaacaaacgtcaagtcacatagggccgggaagctctgtataccgggaaattattggtattgtacaagaccc
aacaataacaccagaaaattccattcacatagggccgggaagctctgtataccgggaaattattggtattgtacaagaccc
actgttaacttgagtcgccccagtggaacaaacacattgaaacagatcgatcaagctcaagctcagagacatcagacaaagcac
cgtgttttaatcagagctccggcggtgatgtcgaaatcgtaatgcactcttttaattgtgggggtgaattttttactgcaattct
acacaattgtttaacagcacctggaaacggcaatgacacatggaatgacacctggaaagatacgcacaaatgataattactcttc
cgtgcagaataaagcaaatcgtaaatatgtggcaaaaagtggaagccatgtacgccaccctataagaggacaaaattcgctg
ttcttccaagatcacaggtctgatactcacacgggacggagccagaaacgggacaaacagacccgagaccttcgaccaggagggc
ggcaacatgaaggataactggagaagtgaactttacaagtataaagtgtcaagattgagcctctgggtatcgccctactaagg
ctaaacactcacctgcagctagattgctgctttcagggatagtcacaaacaaacagaaacaccttcttagagccattgaagcaca
acaacacttgcagtgacagtggtgggaattaaacagttgcagggccgggttctcgctgtcgaacgggtatcttagagatcag
cagcttttgggtatctgggggtgttcagggccgctcatatgcaccacaaatgtcccttggaaatacctcatggagtaacaggtctc
ttaattatatattgggacaatatgacatggatgcaatgggtagagaaaatttaataactacacggactacatctacacacttctgga
ggacggccagaaatcagcaggagaagaacgagcaggaactcctcgaaattggataagtgggcatcactgtggaattggttcgatata
actaatggctttggtaaatcttataa

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Fig. 36A

Wild-type subtype C

DU123.6 gp160 (854 a.a)

MRVKGIGQRNWPQWIIIGILGFWMIICRVVGNLWVTYYGVVWTEAKTTLFCASDAKAYEREVHNWATHACVPTDPNPQEIIVL
 GNVTFNFMWKNMVDQMHEDIISIWDQSLKPCVKLTPLCVTLNCTDVKNATSNGTYYNNSIDSMNGEIKNCSEFNITTEIRDK
 KQKVYALFYRPDVVPLNENSSSYILINCSTTTQACPKVSFDPIPIHYCAPAGYAILKCNKTFNGTGPCHNVTQVQTHGIKP
 VVSTQLLNGSLAEEEEIIIRSENLTNNAKTIIVHLNESIEIVCTRPNNTRKSIRIGPGQTVYATNDIIGDIRQAHCNISKTWN
 TTLEKVKELKEHFPSKAITFQPHSGGDLEVTTHSFNCRGEFFYCDTTLFNESENLTNTTTLTPCRIKQIVNMWQGVGRAMY
 APPVEGNITCNSSITGLLLVRDGGNTSNSTPEIFRPGGGMKDNWRSELYKYKVVEIKPLGVAPTAKRRVVEREKRAVGIGAVL
 FGFLGAAGSTMGAASITLTVQARQLLSGIVQQSNLLRAIEAQOHMLQLTVWGKQLQARVLAIERYLKDDQQLGLGWCSGKLLIC
 PTTVPWNSSWSNKSQTDIWDNMTWMQWDREISNYTGTIYKLEESQOQEKNEKDLLALDSWKNLWSWFDITNWLWYIKIFIMIV
 GGLIGLRIIFGVLSIVKRVROGYSPLSFQTLTPNPRGLDRIGRIEEEGGEQDKDRSIRLVNGFLALAWDDLRSLCLFSYHRLRDF
 ILVAARAVELLGRSLRGLQRGWEALKYLGNLVQYGGLELKRRAISLFDTIAIAVAEGTDRILEVILRIIRAIRNIPTRIRQGFEE
 AALL

Fig. 36B

DU123.6 140CF (638 a.a)

Nick name: 013

MRVKGIGQRNWPQWIIIGILGFWMIICRVVGNLWVTYYGVVWTEAKTTLFCASDAKAYEREVHNWATHACVPTDPNPQEIIVL
 GNVTFNFMWKNMVDQMHEDIISIWDQSLKPCVKLTPLCVTLNCTDVKNATSNGTYYNNSIDSMNGEIKNCSEFNITTEIRDK
 KQKVYALFYRPDVVPLNENSSSYILINCSTTTQACPKVSFDPIPIHYCAPAGYAILKCNKTFNGTGPCHNVTQVQTHGIKP
 VVSTQLLNGSLAEEEEIIIRSENLTNNAKTIIVHLNESIEIVCTRPNNTRKSIRIGPGQTVYATNDIIGDIRQAHCNISKTWN
 TTLEKVKELKEHFPSKAITFQPHSGGDLEVTTHSFNCRGEFFYCDTTLFNESENLTNTTTLTPCRIKQIVNMWQGVGRAMY
 APPVEGNITCNSSITGLLLVRDGGNTSNSTPEIFRPGGGMKDNWRSELYKYKVVEIKPLGVAPTAKTLTVQARQLLSGIVQOQ
 SNLLRAIEAQOQHMQLTVWGKQLQARVLAIERYLKDDQQLGLGWCSGKLLICPTTVPWNSSWSNKSQTDIWDNMTWMQWDREISN
 YTGTYKLEESQOQEKNEKDLLALDSWKNLWSWFDITNWLW*

*Amino acids seen in blue color is for easy identification of the junction of the deleted fusion cleavage site.

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Fig. 36C

CODON-OPTIMIZED DU123.6 140CF.seq (1945 nt.)

Nick name: 013

ttcagtcgacagccaccATGCGCGTAAAGGGGATTCAAAGAAATTGGCCGCAATGGTGGATTGGGGAAATTCCTGGGCTTTTGGGAT
GATAATTATATGCCGCGTTGTCGGAAATTTGTGGTGACTGTGTACTACGGGTGCCGTGTGGACTGAGGCAAGACCACCCCTG
TTCTGTCTAGCGATGCCAAGCCTATGAACCGGAATGCACAATGTTTGGCTACTCATGCTGTGTCCTTACCGACCCCAACC
CTCAGGAATAGTGTCTGGCAATGTAAACGGAATCTCAACATGTGAAAAATGATATGGTGATCAGATGCACGAAGACATTAT
CTCAATCTGGACCAAAAGCCTGAAACCCCTGCGTTAACTGACTCCTCTCTGCTCACTCTCAATTCACAGATGTCAAAGTGAAT
GCCACCTCAAACGGTACGACAACTTACAACAATTCTATTGACTCTATGAACGGGAAATCAAAAATTGTTCCTTTAACATCACCA
CCGAGATACGGACAAAAAGCAGAAGTCTATGCCCTTTTACGCCCGGACGTAGTCCCACTCAACGAGAAATCCAGCTCATA
CATCTCATCAACTGCAATACATCAACTACCACACAAGCATGCCGGAAGTTAGCTTTGATCCAAATCCTATACATTACTGCGCC
CCGCCGGCTACGTATACTGAAATGCAATAATAAGACTTTTAAAGGACCGGCCCATGTCAACAAGTGTCAACCGTGCAATGCA
CTCATGGCATCAAGCCCGTGGTGTCAACCCAGCTGCTGCTCAATGGCTCACTTGCAGAAGAAATATTATCCGCTCTGAGAA
TCTTACTAACAATGCAAAAACGATTATCGTGCACTTAAATGAATCAATAGAAATCGTGTACTCGGCCCAACAATAATACTAGA
AAAGCATTCGCATCGGACCTGGCCAGACAGTTTACGCAACTAATGACATCATCGGGACATCCGACAGGCCCATTGCAACATTT
CTAAAACCAAGTGGAATACAACCCCTGGA AAAAGTAAAGGAAAACTTAAAGAACATTTTCCCTCTAAGCGGATCACGTTTCAACC
TCACAGTGGCGGAGCTTGAAGTCACAACACATCTTTTAACTGCGCGGAGAAATTTTATTATGTGATACACA AAAACTTTT
AATGAATCAAAATCTCAACACCAACAATAACAACCACTGACCTCCCTGTAGAAATCAACA AAATCGTAAACATGTGGCAAGGG
TTGGAAGGGCTATGTACGCTCCCCCGTGAAGGAATAATAACGTGTAAACAGCAGCATCACTGGCTGCTTCTTGTTCGAGACGG
AGGCAATACTTCTAATTCAACTCCTGAAATTTTAGGCTGGCGGTGGCAATATGAAGATAACTGGCGCTCAGAACTGTACAAA
TACAAAAGTTGTGAAATTAAGCCCTGGAGTCGCTCCAACCAAGCTAAAACACTCACAGTGAAGCAAGACAGCTCCTTTTCAG
GCATCGTCCAGCAACAGTCAAAATCTCTTAGAGCAATCGAAGCCCAAGCATATGCTGCAACTCACAGTCTGGGGATTAAACA
GCTTCAAGCCCGGCTGTGCTATCGAACGCTATCTTAAAGACCAACAGCTTCTTGGCCCTGCGGTGTAGTGGAAAACTCATC
TGCCCCACCACCGTGCCTTGAATAGTTCTTGGAGTAATAAATCACAGACCGATATTGGGACAAACATGACCTGGATGCAATGG
ATAGGGAATTTCTAATTACTGGCACAATCTACAAACTCTTGAAGAAAGTCAAAATCAGCAAGAAAAAAACGAAAAGGACCT
CCTCGCCCTGGACTCCTTGAAGAATCTTTGGAGCTGTTTGACATAACTAATTGGCTGTGGtaagatcttataa

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Fig. 37A

Wild-type subtype CRF01_AE

97CNGX2F-AE (854 a.a.)

MRVKETQMNWPNLWKWGTLLGLVICSASDNLWTVYGVVWRDADTTLFCASDAKAHETEVEHNVWATHACVPTDPNPQEIHL
 ENVTFENFNMWRNMMVEQMDEVISLWDQSLKPCVKLTPLCVTLNCTNANWTNSNNTTNGPNKIGNITDEVKNCTFNMTELKDKK
 QKVHALFYKLDIVQINSSEYRLINCNTSVIKQACPISFDPIPIHYCTPAGYAILKCNCKNFNGTGPCKNVSSVQCTHGKIPVVS
 TQLLNGSLAEEIIIRSENLTNNAKTIIIVHLNKSVEINCTRPSNNTRTSITMGPGQVFYRTGDIIGDIRKAYCEINGIKWNEVL
 VQVTGKLKEHFNKTIIFQPPSGGDLEIITHHFSRCRGEFFYCNNTKLFNNTCIGNTSMEGCNCNTIILPCKIKQIINMWQGVQAMV
 APPISGRINCVSNTGILLTRDGGADNNTTNETFRPGGNIKDNWRSELYKYKVVEIEPLGIAPTRAKRRVVEREKRAVGIGAMI
 FGLGAAGSTMGAASITLTVQARQLLSGIVQQSNLLRAIEAQHLLQLTVWGIKQLQARVLAVERYLKDQKFLGLWGCSCGIIC
 TTAVPWNSSWSNKSFEIWDNMTWIEWEREISNYTSQIYEILTESQNQQDRNEKDLLELDKWASLWNWFDITNWLWYIKIFIIIV
 GSLIGLRIIFAVLSIVNRVRQGYSPLSFQTPTHHQREPRPEEIGECCGEQSKDRSVRLVSGFLALAWDDLRLSLCLFSYHLLRDF
 ILIAARTVELLGHSSKGLRRGWEGLYKLGILLWYGGQEIKAISALINATAIAVAGWTDRIEVAQRAWRALHHPRIRQGLE
 RALL

*Amino acid sequence underlined is the fusion domain that will be deleted in 140CF design and the "W" underlined with red color is the last amino acid at the C terminus, and all the remaining amino acids after the "W" will be deleted in 140CF design.

Fig. 37B

97CNGX2F-AE 140CF.pap (629 a.a.)

Nick name: 018

MRVKETQMNWPNLWKWGTLLGLVICSASDNLWTVYGVVWRDADTTLFCASDAKAHETEVEHNVWATHACVPTDPNPQEIHL
 ENVTFENFNMWRNMMVEQMDEVISLWDQSLKPCVKLTPLCVTLNCTNANWTNSNNTTNGPNKIGNITDEVKNCTFNMTELKDKK
 QKVHALFYKLDIVQINSSEYRLINCNTSVIKQACPISFDPIPIHYCTPAGYAILKCNCKNFNGTGPCKNVSSVQCTHGKIPVVS
 TQLLNGSLAEEIIIRSENLTNNAKTIIIVHLNKSVEINCTRPSNNTRTSITMGPGQVFYRTGDIIGDIRKAYCEINGIKWNEVL
 VQVTGKLKEHFNKTIIFQPPSGGDLEIITHHFSRCRGEFFYCNNTKLFNNTCIGNTSMEGCNCNTIILPCKIKQIINMWQGVQAMV
 APPISGRINCVSNTGILLTRDGGADNNTTNETFRPGGNIKDNWRSELYKYKVVEIEPLGIAPTRARTLTVQARQLLSGIVQQQ
 SNLLRAIEAQHLLQLTVWGIKQLQARVLAVERYLKDQKFLGLWGCSCGIICTTAVPWNSSWSNKSFEIWDNMTWIEWEREISN
 YTSQIYEILTESQNQQDRNEKDLLELDKWASLWNW*

*Amino acids seen in blue color is for easy identification of the junction of the deleted fusion cleavage site.

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Fig. 37C

CODON-OPTIMIZED 97CNGX2F-AE 140CF.seq (1921 nt.)

Nick name: 018

ttcagtcgacagccaccatgCGAGTAAAGAGACACAAATGAATTGGCCCAATTGTGGAAGTGGGGAACATTGATCCTGGGACT
GGTGATAATCTGTAGTGCATCCGACAAATCTCTGGGTGACCGTTTACTATGGTGTACCAAGTTTGGAGAGACGCTGATACCAACCCCTC
TTCTGTGCAAGCGACGCCAAAGCCACGAAACTGAAGTCCATAATGTATGGCCACCCACGCGTGCGTACCAACCGACCCCTAATC
CCCAAGAGATCCACCTTGAGAATGTAACTGAGAAATTTAAACATGTGGAGAAATAACATGGTGAACAACAATGCAGGAAGACGTTAT
TTCCTTGTGGGACCAGAGCCTTAAACCTTGTGTCAAAATTGACTCCCTGTGTGTGACTCTCAATTGTACAAACGCAAAATTGGACC
AACAGCAACAACACTACCAACGGCCCTAACCAAAATTGGCAATATTACTGATGAAGTCAAGAACTGCACCTTTTAACATGACACACAG
AACTGAAGGATAAGAAACAGAAAGTCCATGCTGTCTTATTAAGCTGACATAGTACAAATTAATAGCTCAGATATATAGACTGAT
AACTGCAATACTCCGTATCAAAACAGGCTGTCCAAGATAAGCTTCGATCCCATCCCTATTCACTACTGCCACACACCCGGT
TACGCTATCCTGAAATGCAACGATAAGAAATTTAACGGCACAGGTCCCTGCAAAAACGTTTCTCTGTCTGCTGACACACACGGTA
TCAAGCCTGTAGTATCAACACCAACTGCTCCTGAATGGCTCCTTGCCCGAAGAGAGATCACTATTAGAACTGAGAACTGACCGAA
CAACGCCAAGACTATAATAGTGCACCTCAATAAATCTGAGAAATCAACTGTACCCGACCCCTCAAAACAACCTCGAACAAGTATA
ACAAATGGGCCCCTGCCCAAGTTTTCACGGACCCGGGACATAATAGGCGATATCAGAAAGGCATATATCCAGCCCCGAGTGGCGG
AGTGGAAACGAAGTACTGGTCAAGTAACTGGAAACTCAAGAACTTTTAATAAGACCAATAATATCCAGCCCCGAGTGGCGG
CGACCTCGAGATTATCACCATCACTTTTCTGTAGAGGCGAAATTTTACTGTAACACGACCAAGCTTTCATAAACAAGTGC
ATCGGGAACACTTCTATGGAAGGATGTAATAATACCATTATACCTGCTGTAAGATCAAGCAGATTATCAACATGTGGCAGGGAG
TAGGTCAGGCAATGTACGCCACCCGATTTCAAGACGGATCAATTGCGTATCAAAATATCACCGCATTTCTGTACCCGGACCG
AGCGCAGACAAACAATACCACTAACGAGACATTTAGACCTGGAGGCGCAATATAAGGATAATTGGAGAAGTGAGCTGTATAAA
TACAAAGTCGTAGAGATCGAACCCCTCGGCATTTGCTCCAACCCGGCCCGGACTCTCACCGTACAAAGCTAGACAGCTGCTTCTG
GCATAGTCCAAACAGCAGTCAAACTCCTCCGCGCTATTGAAGCACAACAACCTGCTCCAGCTGACTGTGTGGGAATCAAAACA
ATTGCAAGCAAGAGTGTCTGCGCGTGGAAACGCTATTGAAAGATCAGAAATTTCTTGGACTTTGGGGCTGCAGCGGCAAAATATT
TGTAACAACAGCGGTGCTTGGAACTCATCCTGGAGTAATAAAAGCTTTGAAGAAATCTGGGACAATATGACATGGATTGAGTGGG
AGAGAGAGATTTCAAACTATACAAGCCAAATTTACGAAATACTGACAGAAAGTCAAAACCCAGCAGGACAGAAATGAGAAAGACCT
GCTCGAACTGGATAAGTGGCCCTCTTTGTGGAACCTGGtaagatcttataaa

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Fig. 38A

Wild-type DRCBL-G (854a.a.)

MRVKGIQRNWQHLLWNGILILGLVICS~~AEKLWVT~~YGVVWEDANAPLFCASDAKAHSTESHNIWATHACVPTDPSQEI~~NMR~~
 NVTENFNMWKNMVEQMHEDIISLWDESLKPCVKLTPLCVTLNCTEINNSTRNITEEYRMTNCSFNMTTEL~~RDKKAEYALFYR~~
 TDVVPINEMNNENGTSTWYRLTNCNVSTIKQACPKVTFEPIPIHYCAPAGFAILKCV~~DKKENG~~TGTCNNVSTVQCTHG~~IKPVV~~
 STQLLNGSLAEKDIIISSENISDN~~AKVIVHLNRSVEIN~~CTRPNNTRRSVAIGPGQAFYTTGEVIGDIRKAHCNVSWTKWNET
 LRDVQAKLQ~~EYFINKSIEFNSSSGG~~DL~~ETTHSFNCGGEFF~~YCN~~TSGLFNNSILKSNISENN~~DTITL~~NCKIKQIVRMWQ~~RVGQAM
 YAPPIAGNITCRSNITGLILTRDGGDNNSTSEIFRPGGDMKNWRS~~EYKYKTVKIKSLGI~~APTRARRRVEREKRAVG~~VGAIF~~
 LGFLGTAGSTMGAASITLT~~VQVRQLLSGIVQQQ~~NLLRAIEAQHLLQLTVWGIKQLRARVLALERYLK~~DQQLLGIW~~CSCGK~~LIC~~
 TTNVPWNTSWSNKS~~YNEIWENMTWIEWEREIDNYTHIYSLIEQSQIQE~~KNEQDL~~LALDQWASLWSF~~SISNWLWYIRIFVMIV
 GGLIGLRIVFAVLSIVNRVRQGYSP~~LSFQTLHHQREPD~~RPA~~GIEGGEGQDRDRSIRLVSGFLA~~WDDLRSLCLFSYHRLRDF
 ILIAARTVELLGRNSL~~KGLRGWEAL~~KYLWNL~~LLYWAREL~~KNSAINLLDTIAIAVANWTD~~RVIEWA~~QRAVLNIPRRIRQGLE
 RALL

*Amino acid sequence underlined is the fusion domain that will be deleted in 140CF design and the "W" underlined with red color is the last amino acid at the C terminus, and all the remaining amino acids after the "W" will be deleted in 140CF design.

Fig. 38B

DRCBL-G 140CF.p_{ep} (630 a.a.)

Nick name: 017

MRVKGIQRNWQHLLWNGILILGLVICS~~AEKLWVT~~YGVVWEDANAPLFCASDAKAHSTESHNIWATHACVPTDPSQEI~~NMR~~
 NVTENFNMWKNMVEQMHEDIISLWDESLKPCVKLTPLCVTLNCTEINNSTRNITEEYRMTNCSFNMTTEL~~RDKKAEYALFYR~~
 TDVVPINEMNNENGTSTWYRLTNCNVSTIKQACPKVTFEPIPIHYCAPAGFAILKCV~~DKKENG~~TGTCNNVSTVQCTHG~~IKPVV~~
 STQLLNGSLAEKDIIISSENISDN~~AKVIVHLNRSVEIN~~CTRPNNTRRSVAIGPGQAFYTTGEVIGDIRKAHCNVSWTKWNET
 LRDVQAKLQ~~EYFINKSIEFNSSSGG~~DL~~ETTHSFNCGGEFF~~YCN~~TSGLFNNSILKSNISENN~~DTITL~~NCKIKQIVRMWQ~~RVGQAM
 YAPPIAGNITCRSNITGLILTRDGGDNNSTSEIFRPGGDMKNWRS~~EYKYKTVKIKSLGI~~APTRARTLT~~VQVRQLLSGIVQQQ~~
 SNLLRAIEAQHLLQLTVWGIKQLRARVLALERYLK~~DQQLLGIW~~CSCGK~~LIC~~TNVPWNTSWSNKS~~YNEIWENMTWIEWEREIDN~~
 YTHIYSLIEQSQIQE~~KNEQDL~~LALDQWASLWSW*

*Amino acids seen in blue color is for easy identification of the junction of the deleted fusion cleavage site.

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Fig. 38C

CODON-OPTIMIZED DRCBL-G 140CF.seq (1921 nt.)

Nick name: 017

ttcagtcgacagccaccatgagagttaaaggaatccaacgcaattggcaacacacctttggaaactggggcattattgattcttggact
ggatgataatttgtagcgctgaataaactctgggttaactgtctattacggcgtgctgtctggaggatgccaaagcccccctgttct
tgccgaagtgatgcaaggctcacagcactgaatctcaacaactttgggccacccacgctgtgtgccaaaccgaccctagtccctc
aggagatcaacatgagapacgttacggaatttttaatatgtggaagaataatatgttgagcaaatgcacgaagacataatttc
actctgggacgagctctctgaaaccatgtgtgaaacttacccccctgtgctcacctgaaactgtaccgaaatcaacaataactca
acgagaaatatcacagaagaataaccgaatgactaaactgttcctttaatatgacaaacgaaactgcgagacaaaagaaggctgaat
acgcactttttaccgaacagatgttgtaaccaatcaacgagatgaacaatgaaaacaatggaacgaaactctacctggatatagact
gacaaactgtaacgttagcacaaatcaagcagccctgccccctaaagtacacattcgaaaccaataccattcactactgcccacccgcc
ggattcgctatttcttaagtccgtggataagaagtttaacggaaactggaacctgcaataatgtatctacagtacaatgcacgcattg
gaattaaacctgtcgtttcaacccagtttgctgctgaatggatcactcgagaaaggatattattatctcaagcgaataacatatc
tgataatgcaaaaggctcatatcgctccactcaacccgtcagttgaaataaactgcactcgcccttaataataacacagacgctct
gtcgcaatcgccccaggaacagctttttacactaccgggaagtattcgccgacatacggaaagcccaactgcaacgttagctgga
ccaaagtgaatgaacacactgcgcgattgttcaagccaaactcaagaatacttcaataacaatacaattgagttcaattctagctc
tgccggcgacctcgagattacaactcactcctttaaactgcggcggaattctttattgtataacctccggtctcttcaacaac
tctatcctcaaaagtaacatttctgaaaataatgacacaatcacactgaattgcaagatcaagcagattgttaggatgtggcaac
gagtcggacaaagctatgtacgccccaccatcgccggaataataacgtgctcgatcaaatatcactggcctcatccttactagaga
tgccggagacaataatagcaccagcgagataattcagaccagcgaggcgatataaaaacaactggaggctcagagctctacaag
tacaaaacagtcaaaattaaaagcctgggcatctgctccactcgggcccgccacactgactgtccaaagtcggacagctcctgtccg
gaatcgccaacaacagtcacactgtctgcgcgtatagaggctcaacaacatctccttcaactgactgtgtgggtatcaaca
attgagagcaagagtgctggcgctggaacggatctttaaggaccacaactcctgggcatatgggggtgtccggcaaacctgac
tgacacaacaattgtacccctggaaacacacagctggtaaatgagatatgggaaacatgacatggattgaattggg
aaagggaattgacaattatatacataccatatatactctcctcatcgaaacaatctcagatacacacaggaataagaatgaacaagattt
gttggctcttgaccaatgggcttctttgtggagttggtaaatcttaca

2003 Centralized HIV-1 Envelope Proteins and the Codon-Optimized Gene sequences

Fig. 39A

2003 Cons Env

MRVMGIQRNCQHLRWGILIFGMLIICSAEENLWTVVYGVVPVWKEANTTLFCASDAKAYDTEVHNWVWATHACVPTDPNPQEIIVLENTENF
 NMWKNMVEQMHEDIISLWDQSLKPCVKLTPLCVTLNCTDVNATNNTNNEEIKNCSEFNITTEIRDKKKVYALFYKLDVVPIDNNNSYRLI
 NCNTSAITQACPKVSFEPIPIHYCAPAGFALLKCNCKKFNCTGTPCKNVSTVQCTHGKIPVSTQLLNGSLAEEIIIRSENIITNNAKTIIV
 QLNESVEINCTRPNNNTRKSIRIGPGQAFYATGDIIGDIRQAHNCISRTKWNKTQQVAKKIREHFNKTIIFNPSSGGDLLEITTHSFNCGGE
 FFYCNTSELFNSTWNGTNTITLPCRKQIINMWQGVQAMYPPIEGKIRCTSNITGLLLTRDGGNNNTETFRPGGDMRDNRSELKYKY
 VVKIEPLGVAPTAKRRVVEREKRAVGIGAVFLGFLGAAGSTMGAASTLTQVQARQLLSGIVQQSNLLRAIEAQHLLQLTVWGIKQLQAR
 VLAVERYLKDQQLGIWGCCKLICTTNVPWNSSWSNKSQDEIWDNMWMEWDKEINNYTDIIYSLIEESQNOQEKNEQELLALDKWASLWN
 WFEDITNWLWYIKIFIMIVGGLIGLRIVFAVLSIVNRVRQGYSPLSFQTLIPNPRGPDPEGIEEGEGQDRDRSIRLVNGFLALAWDDLRLS
 CLFSYHRLRLDLILIAARTVELLGRRGWEALKYLWNLQYWGQELKNSAISLLDTTAIAVAEGTDRVIEVQVRCRAILNIPRRIRQGFERAL
 LL\$

Fig. 40A

2003 M. Group .AnC. Env

MRVMGIQRNCQHLRWGILIFGMLMICSAEENLWTVVYGVVPVWKEANTTLFCASDAKAYDTEVHNWVWATHACVPTDPNPQEIIVLENTENI
 NMWKNMVEQMHEDIISLWDQSLKPCVKLTPLCVTLNCTDVNATNNTNNEEIKNCSEFNITTEIRDKKKVYALFYRLDVVPIDNNNSYRLI
 NCNTSAITQACPKVSFEPIPIHYCAPAGFALLKCNCKKFNCTGTPCKNVSTVQCTHGKIPVSTQLLNGSLAEEIIIRSENIITNNAKTIIV
 QLNESVEINCTRPNNNTRKSIRIGPGQAFYATGDIIGDIRQAHNCISGAEMWNTLQQVAAKIREHFNKTIIFKPSSGGDLLEITTHSFNCGG
 EFFYCNTSGLFNSTWNGTNETITLPCRKQIVNMWQVQAMYPPIAGNITCKSNITGLLLTRDGGTNTTETFRPGGDMRDNRSELKYKY
 KVKIEPLGVAPTAKRRVVEREKRAVGIGAVFLGFLGAAGSTMGAASTLTQVQARQLLSGIVQQSNLLRAIEAQHLLQLTVWGIKQLQA
 RVLAVERYLKDQQLGIWGCCKLICTTNVPWNSSWSNKSQDEIWDNMWMEWDKEINNYTDIIYSLIEESQNOQEKNEQELLALDKWASLW
 NWFEDITNWLWYIKIFIMIVGGLIGLRIVFAVLSIVNRVRQGYSPLSFQTLIPNPRGPDPEGIEEGEGQDRDRSIRLVSGFLALAWDDLRS
 LCLFSYHRLRDLFILIAARTVELLGRRGWEALKYLWNLQYWGQELKNSAISLLDTTAIAVAEGTDRVIEVQVRCRAILNIPRRIRQGFERA
 LL\$

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Fig. 39B

2003 CON-S Env.seq.opt

ATGCGCGTGATGGGCATCCAGCGCACTGTGGCGTGGGCATCCTGATCTTCGGCATGCTGATCATCTGCTCCGCGCGCGA
GAACCTGTGGTGACCGTGTACTACGGGTGCCGTGTGGAAGAGGCCAACACCACTCTGCTGGCGCTCCGACGCCAAGGCTTACGACA
CCGAGGTGCACAACGTGTGGGCCACCCACCGCTGCGTCCACCGACCCCAACCCCGAGGAGATCGTGTGGAGAACGTGACCGAGAACTTC
AACATGTGGAAGAACACATGGTGGAGCAGATGCACGAGGACATCATCTCCCTGTGGGACCAAGTCCCTGAAGCCCTGCGTGAAGCTGACCCC
CCTGTGCGTGACCTGAACTGCACCGACGTGAACGCCACCAACACACCAAGAGGAGATCAAGAACTGCTCTTCAACATCACCA
CCGAGATCCGCGACAAGAAAGAGGTGTACGCCCTGTCTACAAAGCTGGACGTGGTGCCCATCGACGACAACAACTCCTACCGCCTGATC
AACTGCAACACCTCCGCCATCACCCAGGCCTGCCCAAGGTGCTTCGAGCCCATCCCCATCTACCTGCGCCCCCGCGCTTCGCCAT
CCTGAAGTGCAAACGACAAGAAGTTCAACGGCACCGGCCCTGCAAGAACGTGTCCACCGTGCAGTGACCCACGGCATCAAGCCGTGGTGT
CCACCCAGCTGCTGTGAACGGCTCCCTGGCCGAGGAGGAGATCATCTCCGCTCCGAGAACATCAACCAACGCCCAAGACCATCATCTCGTG
CAGCTGAACGAGTCCGTGGAGTCAACTGCACCCGCCCAACAAACACCCCGAAGTCCATCCGCATCGCCCCCGGCGAGCCCTTCTACGC
CACCGCGACATCATCGCGAGATCCGCCAGGCCACTGCAACATCTCCCGCAACCAAGTGGAAACAAGACCTGACGACAGTGGCCAAAGAAC
TGCGCGAGCACTTCAACAAGACCATCATCTTCAACCCCTCTCCGGCGGACCTGGAGATCACCACTCTCTTCAACTGCGGCGCGGAG
TTCTTCTACTGCAACACTCCGAGCTGTTCAACTCCACTGGAACGGCACCAACACCATCACCTGCCCTGCCGCATCAAGCAGATCA
CAACATGTGGCAGGGCTGGGCCAGGCCATGTACGCCCCGCCCATCGAGGGCAAGATCCGCTGCACCTCAACATCACCGCCTGCTGTGT
CCCGCGACGGCGCAACAAACAACCGAGACCTTCGCCCCGGCGGCGACATCGCGGACAACTGGCGCTCCGAGCTGTACAAGTACAAC
GTGTTGAAGATCGAGCCCTGGCGTGGCCCCCAAGCCCGCGTGTGGAGCGCGGAGAACGCGCGCTGGGCATCGGCGCGCGT
GTTCTTGGGCTTCTTGGGCGCGCGGCTCCACATGGGCGCGCTCCATCACCTGACCGTGCAGGCCCGCCAGCTGTCTCCGGCATC
TGACGACGAGTCCAACCTGTGCGGCCATCGAGGCCACGAGCACCTGTGCAGCTGACCGTGTGGGCATCAAGCAGCTGCAGGCCCGC
GTGCTGGCCGTGGAGCGCTACCTGAAGGACGAGAGCTGTGGGCATCTGGGCTGTCCGGCAAGTGTCTGCACCAACCACTGACCGCTG
GAACTCCTCCTGTCCTGATCGAGGAGTCCAGAACGAGCAGGAGAACGAGCAGGAGCTGTGGCCCTGGACAAGTGGGCTTCCCTGTGGAAC
TTGTTTCGACATCACCAACTGGCTGTGTACATCAAGATCTTCATATGATCGTGGCGGCTGATCGGCTGCGCATCGTGTTCGCGGTGCT
GTCCATCGTGAACCGCGTCCCGCAGGCTACTCCCCCTGTCTCCAGACCTGATCCCCCAACCCCGGGCCCCCGACCCCGGAGGGCA
TCGAGGAGGAGGGCGGAGCAGGACCGGACCGCTCCATCCGCTGTGTGAACGGCTTCTTGGCCCTGGCTGGGACGACCTGCGCTCCCTG
TGCCCTGTTCTCTACCAACCGCTGCGGACCTGATCTGATCGCGCGCACCGTGGAGCTGTGGGCGCGCGGCTGGGAGGCCCTGAA
GTACCTGTGGAACCTGTGCAGTACTGGGCGCAGGAGTGAAGAACTCCGCCATCTCCCTGCTGGACACCAACGCCATCGCGTGGCGGAGG
GCACCGACCGCGTGAITCGAGGTGGTGCAGCGCTGTGCCGCCCATCTGAACATCCCCCGCGCATCCGCCAGGCTTCGAGCGCGCGCTG
CTGTAA

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Fig. 41A

2003 CON A1 Env

MRVMGIQRNCQHLLRWGTMILGMIICSAEENLWTVYYGVPVWKDAETTLFCASDAKAYETEMHNWATHACVPTDPNPQEIHLNVTEEF
 NMWKNMVEQMHTDIIISLWDQSLKPCVKLTPLCVTLNCSNVNVTNNTNTHHEEIKNCSEFNTTELDRKKQKVSYSLFYRLDVVPINENNSNS
 SYRLINCNTSAITQACPVSFEPIPIHYCAPAGFAILKCKDKEENGTPCKNVSTVQCTHGKIPVSTQLLNGSLAAEEVIRSENITNNA
 KTIIVQLTEPVKINCTRPNNTRKSIIRIGPGQAFYATGDIIGDIRQAHCVSRSEWNKTLOKVAQLRKYFKNKTIIFTNSSGGDLEITTHS
 FNCGGEFFCYNTSGLENTSWNGTMTNTITLPCRIKQIINMWQAGQAMYPPIQGVIRCESNITGLLTRDGGNNNTNETFRPGGDMRDN
 WRSELYKYKWKIEPLGVAPTRAKRRVVEREKRAVGIGAVELGFLGAAGSTMGAASITLTQARQLLSGIVQQSNLLRAIEAQHLLKLTIV
 WGIKQLQARVLAVERYLKDQQLLGWCSGKLICTTNVPWNSWSNKSQNEIWDNMTWLQWDKEISNYTHIIYNLIEESQKQKNEQDLLA
 LDKWANLWNVFEDISNWLWYIKIFIMIVGGLIGLRIVFAVLSVINRVQGYSPLSFQTHTPNPRGLDRPGRIEEGEGEQGRDRSIRLVSGFLA
 LAWDDLRSICLFSYHRLRDFILIAARTVELLGHSSSLKGLRLGWEGLYLWNLLLYWGRELKISAINLVDITIAIAGWTDRIEIGQIRIGRA
 ILHIPRRIRQGLERALL\$

Fig. 42A

2003 A1.Anc Env

MRVMGIQRNCQHLLRWGTMIFGMIICSAEENLWTVYYGVPVWKDAETTLFCASDAKAYDTEVHNWATHACVPTDPNPQEIHLNVTEEF
 NMWKNMVEQMHTDIIISLWDQSLKPCVKLTPLCVTLNCSNVNVTNNTNTHHEEIKNCSEFNTTELDRKKQKVSYSLFYRLDVVPINENNSNS
 SYRLINCNTSAITQACPVSFEPIPIHYCAPAGFAILKCKDKEENGTPCKNVSTVQCTHGKIPVSTQLLNGSLAAEEVIRSENITDNA
 KTIIVQLTEPVKINCTRPNNTRKSIIRIGPGQAFYATGDIIGDIRQAHCVSRSEWNKTLOKVAQLRKHFNKKTIIFNSSGGDLEITTHS
 FNCGGEFFCYNTSGLENTSWNGTMTNTITLPCRIKQIINMWQVQAMYPPIQGVIRCESNITGLLTRDGGNNNTNETFRPGGDMRDN
 WRSELYKYKWKIEPLGVAPTRAKRRVVEREKRAVGIGAVELGFLGAAGSTMGAASITLTQARQLLSGIVQQSNLLRAIEAQHLLKLTIV
 WGIKQLQARVLAVERYLKDQQLLGWCSGKLICTTNVPWNSWSNKSQDEIWDNMTWLQWDKEISNYTHIIYNLIEESQKQKNEQDLLA
 LDKWANLWNVFEDISNWLWYIKIFIMIVGGLIGLRIVFAVLSVINRVQGYSPLSFQTHTPNPEGDRPGRIEEGEGEQGRDRSIRLVSGFLA
 LAWDDLRSICLFSYHRLRDFILIAARTVELLGRSSSLKGLRLGWEGLYLWNLLLYWGRELKISAINLDTIAIAGWTDRIEIGQIRIGRA
 ILNIPRRIRQGLERALL\$

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Fig. 42B

2003 Al.anc Env.seq.opt

[illegible]

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Fig. 43A

2003 CON A2 Env

MRVMGTQRNYQHLLRWGILILGMLIMCKATDLWVTYYGVVPMKADTTLCASDAKAYDTEVHNWATHACVPTDPNPQEVNLENVTEDFN
 MWKNNMVEQMHEDIISLWDQSLKPCVKLTPLCVTLNCSNANTTNSTMEIKNCSYNITTELKDTQKVYSLFYKLDVVQLDESNKSEYYR
 LINCNTSAITQACPKVSFEPIPIHYCAPAGFAILCKDPRFNGTSCNNVSVQCTHGKIPVASTQLLNGSLAEGKVMIRSENITNNAKNI
 IVQFNKPVPIITCIRPNNTNRKSIREFPGQAFYTNDIIGDIRQAHCNINKTKWNATLQKVAEQLREHFPNKTIIIFTNSSGGDLEITTHSFNCG
 GEFFYCNTTGLFNSTWKNGTNTTEQMITLPCRKQIINMWQRVGRAMYAPPIAGVIKCTSNITGIIILTRDGGNNETETERPPGGDMRDNR
 SELYKYKVVVIEPLGVAPTRAKRRVVEREKRAVGMGAVFLGFGAAGSTMGAASITLTVOARQLLSGIVQQSNLLKAIEAQHLLKLTVWG
 IKQLQARVLALERYLDQQLGIWCGSGKLIICATVPWNSSWSNKTQEEIWNMTWLQWDEKISNYTNIYKLEESQNOQEKNEQDLLALD
 KWANLWNWFENITNWLWYIRIFIMIVGGLIGLRIVIAIISVNVNRVROGYSPLSFQIPTENPEGLDRPGRIEEGGQGRDRSIRLVSGFLALA
 WDDLRSCLFSYHRLRDCILIAARTVELLGHSSSLKGLRLGWEGLYLWNLLLYWGRELKNASISLLDTIAVAVAEWTDRIEIGQRACRAIL
 NIPRRIRQGFERALL\$

Fig. 44A

2003 CON B Env

MRVKGIRKNYQHLLRWGTMLLGMLMICSAAEKLWVTYYGVVPMKEATTLFCASDAKAYDTEVHNWATHACVPTDPNPQEVNLENVTENF
 NMWKNMVEQMHEDIISLWDQSLKPCVKLTPLCVTLNCTDEMNATNTNTIIYRWRGEIKNCSENIITTSIRDKVQKEYALFYKLDVVPIDND
 NTSYRLISCNTSVITQACPKVSFEPIPIHYCAPAGFAILCKNDKKFNGTGPCTNVSTVQCTHGIRPVSTQLLNGSLAEEEEVIRSENFTD
 NAKTIIIVQLNESVEINCTRPNNNTRKSIHIGPGRAFYTTGEIIGDIRQAHCNISRAKWNNTLKQIVKLRQFGNKTIVFNQSSGGDPEIVM
 HSFNCGGEFFYCNTTQLFNSTWNGTWNNTGNTIITLPCRKQIINMWQEVGKAMYAPPPIRQIRCSSNITGLLTTRDGGNNETETERPPGGDM
 RDNWRSELYKYKVVVIEPLGVAPTRAKRRVVRQREKRAVGMGAVFLGFGAAGSTMGAASMTLTVOARQLLSGIVQQSNLLRAIEAQHLLQ
 LTVWGIKQLQARVLALERYLDQQLGIWCGSGKLICTTAVPWNASWSNKSLEIWDNMTWMEWEREIDNYTSLIYTLIEESQNOQEKNEQE
 LLELDKWASLWNNWFIDITNWLWYIKIFIMIVGGLVGLRIVEAVLSIVNVVRQGYSPLSFQTRLPAPRGPDRPEGIEEGGERDRDRSGRLVDG
 FLALIWDLLRSCLFSYHRLRDLILLIVTRIVELLGRRGWEVLKYWWNLLQYWSQELKN\$AVSLLNATAIAVAEGTDRVIEVVQRACRAILHI
 PRRIROGLERALL\$

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Fig. 45A

2003 B.anc Env

MRVKGIRKNCQHLLWRWGTMLLGMLMICSAAENLWVTYYGVVPWKEATTILFCASDAKAYETEVEHNVWATHACVPTDPNPQEVVLENVTEF
 NMWKNMVEQMHEDIISLWDQSLKPCVKLTPLCVTLNCTDLNATNTSTNMYRWGEIKNCSENIITSIDKMQKEYALFYKLDVVPIDNN
 TSYRLINCNTSVITQACPVSFEPIPIHYCTPAGFAILKCNKKFNGTGPCNVSTVQCTHGIRPVVSTQLLNGSLAEEEEVIRSENFDTN
 AKTIIVQLNESVEINCTRPNNTRKSIHIGPGRAFYATGEIIGDIRQAHCNLSRAKWNNTLKQVVTKLREQFDNKTIVFNPSSGGDPEIVMH
 SFCGGEFFYCNTTQLENSTWNGTWNTEGNTILPCRICKIINMWQEVGKAMYAPPIRGQIRCSSNITGLLTRDGGNNETEIFRPGGDMR
 DNWRSELYKYKVVKIEPLGVAPTKAKRRVVQREKRAVGIGAMFLGELGAAGSTMGAASMTLTVOARQLLSGIVQQQNNLLRAIEAQHLLQL
 TVWGIKQLOARVLAVERYLRDQQLGIWGC SGKLICTTVPWNASWSNKSLEIWNMTWMEWEREIDNYTGLIYTLIEESQNOQKEQEL
 LEIDKWA SLWNWFDITNWLWYIKIFIMIVGGLVGLRIVEFAVLSIVNRVRQGYSPLSFQTRLPAPRGPDREPIEEEGGERDRDRSGRLVNGF
 LALIWDRLRLSLCLFSYHRLRLDLLLIVARIVELLGRRGWEALKYWWNLLQYWSQELKNSAVSLNATAIAVAEGTDRVIEVVQACRAILHIP
 RRIRQGLERALLS

Fig. 46A

2003 CON C Env

MRVRGILRNQOQWINGILGFWMMLMCNVVGNLWVTYYGVVPWKEAKTTLFCASDAKAYEKEVEHNVWATHACVPTDPNPQEIIVLENVTEF
 NMWKNMVDQMHEDIISLWDQSLKPCVKLTPLCVTLNCTNATNATMGEIKNCSENIITELRDKKQKVYALFYRLDIVPLNENNSYRLINC
 NTSAITQACPVSFDPIPIHYCAPAGYAILKCNKNTFNGTGPCNNVSTVQCTHGIRPVVSTQLLNGSLAEEEEIIRSENLTNNAKTIIVHL
 NESVEIVCTRPNNTRKSIIRIGPGQTFYATGDIIGDIRQAHCNISEDKWNKTILQKVSKKLKEHFPNKTIKFEPSSGGDLEITTHSFNCRGEF
 FYCNTSKLFNSTYNSTNSTITPCRICKIINMWQEVGRAMYAPPIAGNITCKSNITGLLTRDGGKNNTETFRPGGDMRDNWRSELYKYKV
 VEIKPLGIAPTAKARRVVEREKRAVGIGAVFLGELGAAGSTMGAASITLTVOARQLLSGIVQQQNNLLRAIEAQHMLQLTVWGIKQLQTRV
 LAIERYLKDQQLGIWGC SGKLICTTAVPWNSSWSNKSQEDIWNNMTWQWDREISNYTDTIYRLLEDSONQOQKEKDLALLDSWKNLWNW
 FDIITNWLWYIKIFIMIVGGLIGLRIIFAVLSIVNRVRQGYSPLSFQTLTPNPRGPDRLGRIEEEGGEQDRDRSIRLVSGFLALAWDDLRLSLC
 LFSYHRLRDFILIAARAVELLGRSSRLRGLQRGWEALKYGLSLVQYWGLELKKSAISLLDTIAIAVAEGTDRIIELIQICRAIRNIPRRIRQ
 GFEAALQS

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Fig. 47A

2003 C.anc Env

MRVMGILRNCQQWIIWGILGFWMMLMCNVVGNLWVTVYYGVPVWKEAKTTLFCASDAKAYEREVHNVWATHACVPTDPNPQEMVLENVVTENF
 NMWKNMDVDMHEDIISLWDQSLKPCVKLTPLCVTENCTNATNTMGEMKNCSENIITELRDKKQKVYALFYRLDIVPLNDNNSYRLINC
 NTSALTQACPVSFDPPIPIHYCAPAGYAILKCNNTFNGTGPCNNVSTVQCTHGKIPVSTOLLNGSLAEEIIIRSENLTDNAKTIIVHL
 NESVEIVCTRPNNTKRSIRIGPGQTFYATGDIIGDIRQAHNCISEEKWNKTLQRVGEKLFHFPNKTIFAPSSGGDLEITTHSFNCRGEF
 FYCNTSRLENSTYNSKNSTITLPCRIKQIINMWQGVGRAMYAPPIAGNITCKSNITGLLTRDGGKNNTEITFRPGGDMRDNRSELYKYKV
 VEIKPLGIAPTEAKRRVVEREKRAVGIGAVFLGFLGAAGSTMGAASITLTVOARQLLSGIVQQQSNLLRAIEAQQHMLQLTWVGKQLQTRV
 LAIERYLKDOQLLGIWCSGKLICTTAVPWNSSWSNKSQEEIWDNMTMWQWDREISNYTDITYRLLEDSONQKEKNEQDLLALDSWENLWNW
 FDI TNWLWYIKIFIMIVGGLIGLRIIFAVLSIVNRVRQGYSPLSFQTLTPNPRGPDRLGRIEEEGEGEQDRDRSIRLVSGFLALAWDDLRSLC
 LFSYHRLRDFILIAARAVELLGRSSLRGLQRGWEALKYLGSLVQYWGLELKKSAISLLDTIAIAVAEGTDRIIELIQICRAIRNIPRRIRQ
 GFEAALL\$

Fig. 48A

2003 CON D Env

MRVRGIQRNYQHLMRWGIMLLGMLMICSVAENLWVTVYYGVPVWKEATTLFCASDAKSYKTEAHNIWATHACVPTDPNPQEIENVTENF
 NMWKNMVEQMHEDIISLWDQSLKPCVKLTPLCVTLNCTDVKRNNTSNDTNEGEMKNCSENIITTEIRDKKQVHALFYKLDVVPIDDDNNSNT
 SYRLINCNTSAITQACPVTFEPIPIHYCAPAGFAILKCKDKKFGTGPCKNVSTVQCTHGIRPVVSTQLLLNGSLAEEIIIRSENLTNNA
 KIIIVQLNESVTINCTRPYNNTQRTPIGPGQALYTTRIKGDIRQAHNCISRAEWNKTLQOVAKKLGDLNKTIIIFKPSSGGDPEITTHSF
 NCGGEFFYCNTSRLENSTWNNTKWNSTGKITLPCRIKQIINMWQGVGKAMYAPPIEGLIKCSSNITGLLTRDGGANNSSHNETFRPGGDMR
 DNWRSELYKYKVVKIEPLGVAPTRAKRRVVEREKRAIGLGLGAMFLGFLGAAGSTMGAASMTLTVOARQLLSGIVQQQNNLLRAIEAQHLLQL
 TVWGIKQLOARILAVERYLKDOQLLGIWCSGKHICTTTVPWNSSWSNKSLSDEIWNNTMWEREIDNYTGLIYSLIEESQNOQKEQEL
 LEIDKWASLWNWFSITQWLWYIKIFIMIVGGLIGLRIVFAVLSLVNRVRQGYSPLSFQTLTPAPRGPDRPEGIEEGEGEQGRGRSIRLVNGF
 SALIWDLRLNCLFSYHRLRDLILIAARIVELLGRGWEALKYLNLLQYWIQELKNSAISLFDTTAIAVAEGTDRIEIVQACRAILNIP
 TRIRQGLERALL\$

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Fig. 47B

2003 C.anc Env. seq. opt

ATCGCGTGATGGGCATCCTGCGCAACTGCCAGCAGTGGTGATCTGGGGCATCTGGGCTTCTGGATGCTGATGATCTGCAACGCTGGTGGG
CAACCTGTGGTGACCGTGTAACCGCGTGGCGGCGTGGAGAGGCGCAAGACCACTGTTCTGGGCTCCGACGCCAAGGCTACGAGC
GCGAGGTGCACAACGTTGGGCCACCGCTGCTGCCACCGACCCCAACCCCAAGAGATGGTCTGGAGAACGTGACCGAGAACTTC
AACAATGTGAAGAACGACATGGTGGACCAAGATGCACAGGACCATCATCTCCTGTGGGACAGTCCCTGAAGCCCTGGGTGAAGTGAACCCC
CCTGTGCGTGACCTGAACCTGCAACAGCCCAACAGCCCAACCATGAGGAGATGAAGAACTGCTCTTCAACATCACCAACCGAGC
TGCGGCACAAGACGAGGTGTACGCCCTGTTTACCGCTTGACATCGTGCCCTGACGACAACAACTCCTACCGCTGATCAACTGC
AACACTCCGCCATCAACCGGCTGCCCCAAGTGTCTTCGACCCCATCCCATCTCACTACTGCGCCCGCGGCTACGCCATCTCTGAA
GTGCAACAACAAGACCTTCAACGGCACCGGCCCTGCAACAACGTGTCAACGTGACACCGCATCAAGCCCGTGGTGTCCACCC
AGCTGTGCTGAACGGCTCCCTGGCGAGGAGGAGATCATTCGCTCCGAGAACCTGACCGACAACGCCAAGACCATCATCGTGACCCCTG
AAGAGTCCGTGGAGATCGTGTGCACCCCGCCCAACAACAACACCCGCAAGTCCATCCGATCGGCCCGCGGACAGCTTCTACGCCACCGG
CGACATCATCGGCGACATCCGCGAGGCCACTGTCAACATCTCCGAGGAGAGTGAACAAGACCCCTGACGCGGTGGCGAGAAAGCTGAAG
AGCACTTCCCCAACAAGACCATCAAGTTCGCCCCCTTCACTCCACCTACAACCTCAAGAACTCCACCATACCTGCGCTCCGCGCATCAAGCAGATCATCAA
TCTACTGCAACACCTCCCGCTGTTCAACTCCACCTACAACCTCAAGAACTCCACCATACCTGCAAGTCCAACATCACCGGCTGCTGCTGACCC
CATGTGGCAGGGCGTGGCGCGGCCATGTACGCCCCCGCCCATCGCGGCAACATCACCTGCAAGTCCAACATCACCGGCTGCTGCTGACCC
GCGACGGCGCAAGAACACAACCGAGACCTTCCGCCCGCGGCGGCGACATGCGCGACAACCTGGCGCTCCGAGCTGTACAAGTACAAGGTG
GTGAGATCAAGCCCTGGGCATCGCCCCACCGAGGCCAAGCCCGCTGTGTGAGCGCGAGAACGCCGCTGGGCATCGGCCCGCTGT
CCTGGGCTTCTGGGCGCGCGGCTCCACCATGGGCGCGCTCCATCACCTGACCGTGCAGGCCCGCGAGCTGCTGTCCGCGCATCGTGC
AGCAGCATCCAACCTGCTGCGCGCATCGAGGCCAGCAGCATGCTGCACTGACCGTGTGGGCGATCAAGCAGCTGCAGACCCCGCTG
CTGGCCATCGAGCGCTACCTGAAGGACCAAGCAGCTGTGGGCTGCTCCGCGCAAGTGTGCAACCCCGCTGCCCTGGAA
CTCCTCCTGTTCCACAAGTCCCAGGAGGAGATCTGGGACAACATGACCTGGATGCAAGTGGACCGCGAGATCTCCAACATACACCGACACCA
TCTACCGCTGCTGGAGGACTCCCAGAACCAAGCAGGAGAGAACAGCAGGACCTGTGCTGGCCCTGGACTCTCTGGGAGAACCTGTGGAACTGG
TTCGACATCACCAACTGGTGTGTTACATCAAGATCTTCAATCATGATCGTGGGCGGCTGATCGGCCCTGGGCATCATCTTCGCCGTGCTGTC
CATCGTGAACCGGTGCGGCTACTCCCCCTGTCTTCCAGACCTGACCCCCAACCCCCGCGGCCCGGACCGCTGGGCCGATCG
AGGAGAGGGCGGCGAGACCGGCTCCATCCGCTGGTGTCCGGCTTCTGGCCCTGGCCCTGGGACGACCTGCGCTCCCTGTGC
CTGTTCTCTACCAACCGCTGCGGACTTCATCTGATCGCCCGCGCGCTGGAGCTGCTGGGCCGCTCTCCCTGCGCGGCTGACGG
CGGCTGGAGGCCCTGAAGTACCTGGGCTCCCTGGTGCAGTACTGGGGCTGGAGCTGAAGAACTCCGCCATCTCCCTGCTGGACACCATCG
CCATCGCGGTGGCGAGGACCGACCGCATCATCGAGCTGATCCAGCGCATCTGCCGCGCATCCGCAACATCCCCCGCGCATCCGCCAG
GGCTTCGAGGCGCGCTGCTGTA

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Fig. 48B

2003 CON D Env. seq. opt

ATGCGGTGCGGGCATCCAGCGCAACTACCAGCACCTGTGGCGCTGGGCATCATGTCTGGGCATGCTGATGATCTGCTCCGTGGCCGA
GAACCTGTGGGTGACCGGTGTACTACGGCGTGCCTGTGAAGGAGGCCACCAACCCCTGTTCTGCGCTCCGACGCCAAGTCTTACAAGA
CCGAGGCCCAACAATCTGGGCCACCCACGCTGCGTGCCACCGACCCCAACCCAGGAGATCGAGCTGGAGAACGTGACCGAGAATTC
AACATGTGAAGAACAAACATGGTGAGCAGATGACGAGGACATCATCTCCCTGTGGACCACTCCAGAGGCGAGATGAAGAACTGCTCTTCAACA
CCTGTGCGTGACCCCTGAACCTGCACCGACGTGAAGCGCAACAACACCTCCAACGACACCAACGAGGCGAGATGAAGAACTGCTCTTCAACA
TCACCAACGAGATCCGGACAAAGAAAGCAGGTGACGCGCTTCTACAAGCTGGACCTTGAAGGCGATCGAGACAACTCCAACACC
TCCTACCGCTGATCAACTGCAACACCTCCGCCATCACCGGCTGCCCCAAGTGACCTTCGAGCCCATCCCCATCCACTACTGCGCCCC
CGCCGGCTTCGCCATCCTGAAGTGAAGGACAAGAAGTTCAACGGCACCGGCCCCCTGCAAGAACGTGTCCACCGTGCAGTGACCCACGGCA
TCCGCCCCGTGGTTCACCCAGCTGCTGAACGGCTCCCTGGCCGAGGAGAGATCATCATCCGCTCCGAGAACCTGACCAACAACGCC
AAGATCATCATCGTGAGCTGAACGAGTCCGTGACCATCAACTGCACCCGCCCTTACAACAACACCCGACAGCGACCCCATCGGCCCGG
CCAGGCCCTGTACACACCCGCATCAAGGGGACATCCGCCAGGCCACTGCAACATCTCCCGCGCGAGTGGAAACAAGACCCCTGCAGCAGG
TGGCCAAAGAAGCTGGCGACCTGTGAACAAGACCAACATCATCTCAAGCCCTCTCCGGCGGACCCCGAGATCACCAACCCACTCCTTC
AACTGCGGGCGGAGTCTTCTACTGCAACACCTCCCGCTGTTCACCTCCACCTTGAACAACAACCAAGTGAACCTCCACCGCAAGATCAC
CCTGCCCTGCCGCATCAAGCAGATCATCAACATGTGGCAGGGCGTGGAAGGCCATGTACGCCCCCATCGAGGGCCTGATCAAGTGCT
CCTCCAACATCACCGGCTGTGTGACCCCGACGGCGGCCAACAACCTCCACAACGAGACCTTCGCCCCGGCGGCGGACATGCGC
GACAACTGGCGCTCCGAGCTGTACAAAGTACAAGTGGTGAAGATCGAGCCCTGGCGGTGGCCACCCATGGCGCGCCCTCCATGACCCCTGA
GCGCGAAGAGCGGCCATCGGCCCTGGCGCCATGTTCTGGGCTTCTGGCGCGCGCGGCTCCACCATGGCGCGCCCTCCATGACCCCTGA
CCGTGCAGGCCCGCAGCTGTGTCGGCATCGTGACGACGACAACCTGCTGGCGGCCATCGAGGCCCGACGACCTGCTGCAGCTG
ACCGTGTGGGCATCAAGCAGCTGCAGGCCCGCATCCTGGAACCTCGAGCGCTACCTGAAGGACCGACGAGCTGCTGGGCATCTGGGGCTGCTC
CGCAAGCACATCTGCACCAACCGTGCAGGCCCGCATCCTGGAACCTCGAGCGCTACCTGAAGGACCGACGAGATCTGGAACAACATGACCTGGATGG
AGTGGAGCGCGAGATCGACAACCTACACCGGCTGATCTACTCCTGTCACCAAGTCCCTGGACGAGATCTGGAACAACATGACCTGGATGG
CTGGAGCTGGACAAGTGGGCTCCCTGTGGAACCTGTTCTCCATCACCCAGTGGTGTGATCATCAAGATCTTTCATCATGATCGTGGGCGG
CCTGATCGGCTGCGCATCGTGTGCGCGTGTGCGGTAACCGCGTGGCGGCGGCGGCTACTCCCCCTGTCCTTCCAGACCCCTGCTGC
CCGCCCCCGGCGCCCGACCGCCCGAGGGCATCGAGGAGGAGGCGGCGGCGGCGGCGGCTCCATCCGCTGCTGTAACGGCTTC
TCCGCCCTGATCTGGGACGACCTGGGCAACCTGTGCTGTTCTCTACACCGCTGCGCGACCTGATCTGATCGCGCGCGCATCGTGGA
GCTGTGGGCGCGCGGCTGGAGGCCCTGAAGTACCTGTGGAACCTGTGCGAGTACTGATCCAGGAGCTGAAGAACTCCGCCATCTCCC
TGTTTGACACACCGCCATCGCCGTGGCCGAGGCAACCGCGTGATCGAGATCGTGACGCGCGCTGCCGCGCATCTCTGAACATCCCC
ACCCGCATCCGCCAGGGCTGGAGCGGCGCTGCTGTAA

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Fig. 49A

2003 CON F1 Env

MRVRGMQRN̄WQH LGKWGLLEFLGILIIICNAADNLWVTYYGVPVWKEATTLFCASDAKSYEKEVHN̄VWATHACVPTDPNPQEVVLENVTENF
 DMWKN̄NM̄VEQM̄HTDIIISLWDQSLKPCVKLTPLC̄VTLNCTDVNATN̄DNDNKTGAIQNCSEFN̄MTTEVRDKKLKVHALFYKLDIVPI SN̄N̄NSK
 YRLINCNTSTITQACPKVSWDPIPIHYCAPAGVAILK̄CNDK̄RENGTGPCK̄NVSTVQCTHḠIKPVVSTQ̄LLNGSLAEEDIIIRSQ̄NISD̄NAK
 TIIIVHLNESVQ̄INC̄TRPN̄N̄N̄TRKS̄IHLGP̄GQAFYATGEIIIGDIRKAHC̄NISGTQ̄WN̄KTLEQ̄VKAKL̄KSHFP̄N̄KTIKEN̄SSSḠGDLEIT̄M̄HSF
 NCRGEFF̄YC̄NTSGL̄FND̄TGSNGTITLPCRIK̄QIVNM̄WQ̄EVGR̄AMYĀAPIAGN̄ITC̄NSN̄ITGL̄LLTRD̄GGQ̄N̄N̄TETFR̄PGḠGN̄MK̄DN̄WR̄SELY
 KYKV̄VEIEPL̄GV̄APT̄KAK̄RQ̄V̄KRĒRR̄AV̄GIGAV̄FL̄GEL̄GĀḠSTM̄GAASITLT̄VQAR̄QL̄LSḠIVQ̄Q̄N̄LLRAIEAQ̄QH̄LLQ̄LTV̄WḠIKQ̄L
 QARVLAVERYL̄KDQ̄LL̄GL̄WḠCSḠKLICT̄TN̄VP̄N̄SS̄WS̄N̄KSQ̄DEĪWN̄MT̄W̄MEWEKEIS̄N̄YSN̄IIYRL̄IEESQ̄NQ̄Q̄ĒK̄NEQ̄ELL̄ALD̄KWAS
 L̄WN̄W̄F̄DIS̄N̄WL̄W̄YIKĪFIM̄IV̄ḠGL̄IḠLR̄IV̄FAV̄LS̄IV̄NR̄VR̄KḠYS̄PL̄S̄LQ̄TLIP̄SP̄REP̄DR̄PEḠIEEḠḠEQ̄ḠK̄DR̄SV̄RL̄V̄NḠFL̄AL̄V̄W̄DDL
 R̄N̄LC̄L̄FS̄YR̄HL̄R̄DF̄IL̄IĀARĪVD̄R̄GL̄RR̄ḠWĒALK̄YL̄GN̄LTQ̄YWS̄Q̄EL̄K̄NSĀIS̄L̄L̄NT̄TĀIV̄VĀEḠT̄DR̄V̄IEALQ̄R̄AḠRAV̄L̄N̄IP̄RR̄IR̄Q̄GLE
 RALL\$

Fig. 50A

2003 CON F2 Env

MRVREMQRN̄WQH LGKWGLLEFLGILIIICNAADNLWVTYYGVPVWKEATTLFCASDAKAYEREVHN̄VWATYACVPTDPSPQELV̄LGN̄VTENE
 NMWKN̄NM̄VD̄QM̄HEDIIISLWDQSLKPCVKLTPLC̄VTLNCTDVN̄VTINT̄TN̄V̄TEL̄GEIK̄NCSEFN̄ITTEIKDK̄KK̄KEYALFYRL̄DV̄VP̄IN̄NS̄IV̄YR
 LIS̄CNT̄ST̄VTQ̄AC̄PK̄VS̄FEPIPIHYCAPAGVAILK̄CNDK̄KF̄NGT̄GL̄CR̄NV̄STVQCTHḠIR̄PV̄VSTQ̄LLNGSLAEEDIIIRSEN̄ISD̄NT̄K̄TI
 IVQ̄FN̄RS̄VĒINC̄TRPN̄N̄N̄TRKS̄IR̄IḠP̄GRĀFYATGDIIGDIRKAYC̄N̄IN̄RTL̄W̄NET̄L̄KK̄VĀEĒFK̄NH̄FN̄IT̄V̄TF̄NP̄SS̄ḠGDLEIT̄TH̄SF̄N̄CR
 GEFF̄YC̄NTS̄DL̄FN̄TĒVN̄NT̄K̄TITLPCRIK̄Q̄F̄VN̄MW̄Q̄RV̄GR̄AMYĀPIAḠQ̄ĪQC̄NS̄N̄ITGL̄LLTRD̄GḠK̄NḠSET̄LR̄PGḠDM̄R̄DN̄WR̄SELYK
 YKV̄VK̄IEPL̄GV̄APT̄KAK̄RQ̄V̄V̄Q̄RĒK̄RAV̄GIGAV̄LL̄GEL̄GĀḠSTM̄GAASITLT̄VQAR̄QL̄LSḠIVQ̄Q̄N̄LLK̄AIEAQ̄QH̄LLQ̄LTV̄WḠIKQ̄LQ
 ARILAVERYL̄KDQ̄LL̄GĪWḠCSḠKLICT̄TN̄VP̄N̄SS̄WS̄N̄KSQ̄DEĪWD̄N̄MT̄W̄M̄Q̄WEKEIS̄NYT̄DT̄IYRL̄IEAQ̄NQ̄Q̄ĒK̄NEQ̄D̄LL̄ALD̄K̄WD̄NL
 W̄SW̄FT̄IT̄N̄WL̄W̄YIKĪFIM̄IV̄ḠGL̄IḠLR̄IV̄FAV̄LS̄V̄VN̄RV̄R̄Q̄YS̄PL̄S̄LQ̄TLIP̄N̄PR̄ḠPER̄PḠḠIEEḠḠEQ̄D̄R̄DR̄S̄IR̄LV̄SḠFL̄AL̄AW̄DDL̄R
 SL̄CL̄FS̄YR̄HL̄R̄DF̄IL̄IĀART̄VD̄M̄GL̄K̄RḠWĒALK̄YL̄WN̄LPQ̄YWḠQ̄EL̄K̄NSĀIS̄L̄L̄DT̄TĀIĀVĀEḠT̄DR̄IĒVL̄Q̄R̄AḠRAV̄L̄H̄IP̄RR̄IR̄Q̄ḠFER
 ALL\$

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Fig. 49B

2003 CON F1 Env. seq. opt

ATGCGGTGCGGCGCATGCGCAACTGGCAGCACCTGGGCAAGTGGGCGCTGCTGTTCTCTGGGCATCCTGATCATCTGCAACGCCGCCGA
GAACCTGTGGGTGACCGTGTACTACGGCGTGGCGGTGGAGGAGGCCACCAACCTGTTCTGGCGCTCCGACGCCAAGTCTACGAGA
AGGAGTGCAACAACGTGTGGGCCACCCACCGCTGCGTGGCCACCCACCGACCCACAGGAGTGGTGTGGAGAACGTGACCGAGAACTTC
GACATGTGGAAGAACAACATGTGGAGCAGATGCACACCGACATCATCTCCCTGTGGGACCAAGTCCCTGAAGCCCTGCTGAAGTGAACCCC
CCTGTGCGTGACCTGAACCTGACCGACCGACCAACCAACGACACCAAGACCGGCGCCATCCAGAACTGCTCCTTCA
ACATGACCAACCGAGTGGCGACAAGAAGCTGAAGTGCACGCCCTGTTCTACAAAGTGGACATCGTGGCCATCTCCAACAACAATCCAAG
TACCGCTGATCAACTGCAACACCTCCACCATCACCCAGGCTGCCCAAGTGTCTGGGACCCCATCCCATCTCCACTACTGCGGCCCGCG
CGGCTACGCCATCCTGAAGTCAACGACAAGCGCTTCAACGGCACCGGCCCTGCAAGAACGTGTCCACCGTGCAGTGCACCCACGGCATCA
AGCCGTGGTGTCCACCCAGTGTCTGAACGGTCCCTGGCCGAGGAGACATCATCCGCTCCAGAACATCTCCAGAACATCTCCGACAAACGCCAAG
ACCATCATCGTGCACTGAACGAGTCCGTGCAGATCAACTGACCCCGCCCAACAACAACACCCGCAAGTCCATCCACCTGGGCCCGGCCCA
GGCCTTCTACGCCACCGCGGAGATCATCGGCGACATCCGCAAGGCCCACTGCAACATCTCCGGCGGACCTGGAGATCACCATGCATCCTTC
TGAAGGCCAAGCTGAAGTCCCACTTCTACTGCAACACCTCCGGCTGTTCACGACACCGGCTCCACGGCACCATCACCTGCCCTGCCGCATCAA
AACTGCCGCGGCGAGTCTTCTACTGCAACACCTCCGGCTGTTCACGACACCGGCTCCACGGCACCATCACCTGCCCTGCCGCATCAA
GCAGATCGTGAACATGTGGCAGGAGTGGCGCGCCCATGTACCGCGCCCATCGCCGGCAACATCACCTGCAACTCCAACATCACCGGCC
TGCTGTGACCGCGGCGGCGGAGAACACACCGAGACCTTCCGCGCCCGGCGGCAACATGAAGAACACTGGCGCTCCGAGCTGTAC
AAGTACAAGTGTGGAGATCGAGCCCTGGCGTGGCCCAACCAAGCCCAAGCGGCAAGTGTGAAGCGGCGGCGCGCGCTGGCAT
CGCGCGCGTGTCTGGCTTCCCTGGCGCGCGGCTCCACCATGGCGCGCGGCTCCATCACCTGACCGTGCAGGCGCGCGCGCTGTGT
CCGGCATCGTGACGACGACAAACCTGTGCGCGCCATCGAGGCCAGCACCTGTGCGAGTGAACCTGTGGGCGTGCAGCTGATCGACCACTG
CAGGCCCGGTGCTGGCGGTACCTGAAGGACAGCAGCTGTGGCGCTGTGGGCTGCTCCGGCAAGCTGATCGACCACTGCACT
CGTGCCCTGGAACCTCCTGTGTCACAAAGTCCAGGACGAGATCTGGAACAACATGACCTGGATGGAGTGGAGAACGAGATCTCCAAC
ACTCCAACATCATCTACCGCTGATCGAGGATCCCAGAACAGCAGAGGAGAGTGTGGCCCTGGACAAAGTGGGCGCTCC
CTGTGGAACCTGGTTCGACATCTCCAACCTGGTGTGGTACATCAAGATCTTCAATCATGATCGTGGCGGCTGATCGGCTGCGCATCGTGT
CGCCGTGCTGTCCATCGTGAACCGGTGCGCAAGGCTACTCCCGCTGTCCCTGCGACACCTGATCCCTCCCGCGGAGCCGCGCGC
CCGAGGGCATCGAGGAGGCGGCGGAGGCAAGGACCGCTCCGTGCGCTGGTGAACGGCTTCTGGCGCTGGTGTGGGACGACCTG
CGCAACCTGTGCTGTCTCTACCGCACCTGCGGACTTCACTGATCGCGCGCCGATCGTGGACCGCGGCTGCGCGCGGCTGGGA
GGCCCTGAAGTACCTGGGCAACCTGACCCAGTACTGGTCCAGGAGTGAAGAACTCCGCTATCTCCCTGTGAACACCAACCGGCTGTGG
TGGCCGAGGCGACCGACCGGTGATCGAGGCCCTGACGCGCGCGGCGGCTGTGCTGAACATCCCCCGCGCATCCCGCAGGGCTGGAG
CGCGCCCTGCTGTAA

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Fig. 50B

2003 CON_F2 Env. seq. opt

ATGCGCGTGGCGAGATGCAGCGCAACTGGCAGCACCTGGGCAAGTGGGCGCTGCTGTCTCTGGGCATCTGATCATCTGCAACGCCGCCGA
CAACCTGTGGGTGACCGTGTACTACGGCGTGCCCGTGTGGAAGGAGGCCACACACCTGTCTGCGCTCCGACGCCAAGGCCTACGAGC
GCGAGGTGCACAACCGTGTGGGCCACCTACCGCTGCGTGCCACCGACCCCTCCCGCCAGGAGCTGGTCTGGGCAACGTGACCGGAACTTC
AACATGTGGAAGAACAACATGGTGACCAGATGCACGAGGACATCATCTCCCTGTGGGACCACTCCCTGAAGCCCTGCGTGAAGCTGACCCC
CCTGTGCGTGACCCCTGAACCTGCACCGACGTGAACGTGACCATCAACACCAACGTCACCTGGGCGAGATCAAGAACTGCTCCTTCAACA
TCACCAACGAGATCAAGGACAAGAAGAGTAGCCCTGTTCTACCGCTGGACGTGGTGCCCATCAACAACTCCATCGTGTACCGC
CTGATCTCCTGCAACACCTCCACCGTGACCCAGGCTGCCCAAGGTGTCTTCGAGCCCATCCCATCTCACTACTGCGCCCCCGCGGCTT
CGCCATCCTGAAGTGCAACGACAAGAGTTCAACGGCACCGGCTGTGCCGCAACGTGTCCACCGTGCACTGCAACCCACGGCATCCGCCCG
TGGTGTCCACCCAGCTGCTGAACGGCTCCCTGGCCGAGGAGACATCATCCGCTCCGAGAACATCTCCGACAAACACCAAGACCATC
ATCGTGCAGTTCAACCGCTCCGTGGAGATCAACTGCACCCGCCCAACAACAACCCGCAAGTCCATCCGCTCGGCTCGGCGCGCTT
CTACGCCACCGCGACATCATCGGCGACATCCGCAAGGCTACTGCAACATCAACCGCACCTGTGGAAAGAGACCTGAAGAAGTGGCCG
AGGAGTTCAAGAACCACTTCAACATCACCGTGACCTTCAACCCCTCCTCCGCGGCGGACCTTGAGATCAACACCACTCCTTAACTGCGCG
GGCGAGTTCTTCTACTGCAACACCTCCGACCTGTTCAACAACACCGAGTGAACAACAACCAAGACCATCAACCTGCGCTGCGCATCCGCCA
GTTCTGAACATGTGGCAGCGGTGGCGCGCGCCATGTACGCCCGCCCATCGCCGGCGGACATGCGCGCAACTCCAGTCAACATCACCGGCTG
TGCTGACCCCGCAGCGGCAAGAACGGCTCCGAGACCTTGCGCCCGCCAGTGGTGTGCAAGCGGAGAGTGGCGCTCCGAGCTGTAACAAG
TACAAGTGGTGAAGATCGAGCCCCCTGGGCGTGGCCCCCAACAGGCCAAGCGCCAGTGGTGTGCAAGCGGAGAGCGGCGCTGTAACAAG
GCGCGTGTCTGGGCTTCTGGGCGCGCGCGCTCCACATGGCGCCAGCACCTGCTGCAGCTGACCGTGTGGGCGATCAAGCAGCTGCAG
GCATCGTGCAAGCAGTCCAACCTGCTGAAGGCCATCGAGGCCAGCAGCTGCTGGGCATCTGGGCTGCTCCGCAAGCTGATCGACCAACCACT
GCCCGTCACTCCCTGGCGGTGGAGCGCTACCTGAAGGACCAAGTCCAGGACGAGATCTGGGACACATGACCTGGATGCGAGTGGAGAGGAGATCTCCAACTACA
CCGACACCATCTACCGCTGATCGAGGACGCCAGAACCAAGAGAGAGAACGAGACCGTGTGGCTGCGCTGGACCAAGTGGGACAACTG
TGGTCTGGTTACCATCAACACTGGCTGTGTAACATCAAGATCTTCAATCATGATCGTGGCGGCTGATCGGCTGCGCATCGTGTTCGC
CGTGTGTCCGTGTGAACCGGTGCGCCAGGCTACTCCCCCTGTCCCTGCAGACCTGATCCCCAAACCCCGCGGCCCCGAGCGCCCCG
GCGGCATCGAGGAGGCGGCGGAGCAGGACCGGACCGCTCCATCCGCTGTTCGCGCTTCTGCGCTGGCTGGCTGGGACGACCTGCGC
TCCCTGTGCTGTTCTCTACCGCCACCTGCGCGACTTCACTCTGATCGCGCGCCGACCGTGGACATGGGCTGAAGCGCGGTGGAGGC
CCTGAAGTACCTGTGAACCTGCCCCAGTACTGGGGCCAGGAGTGAAGAACTCCGCCATCTCCCTGTGGACACCAACCGCATCGCGGTGG
CCGAGGGCACCGACCGCATCATCGAGGTGCTGCAGCGCGCGGCGCGCTGCTGCACATCCCCCGCGCATCCGCCAGGCTTCGAGCGC
GCCCTGCTGTAA

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Fig. 51A

2003 CON G Env

MRVKGIQRNQHNLWKWGTLILGLVICSASNLLWVTYYGVVPWEDADTTLFCASDAKAYSTERHNWVWATHACVPTDPNPQEIITLENVTEF
 NMWKNMVEQMHEDIISLWDESLKPCVKLTPLCVTLNCTDVNTNNTNNTKKEIKNCSEFNITTEIRDKKKKEYALFYRLDVVPINDNGNSS
 IYRLINCNVSTIKQACPVTFDPIPIHYCAPAGFAILKCRDKKENGTPCKNVSTVQCTHGKIPVSTQLLNGSLAEEIIIRSENIITDNT
 KVIIVQLNETIEINCTRPNNTRKSIIRIGPGQAFYATGDIIGDIRQAHCVSRTKWNEMLOKVKAQLKKIFNKSSITFSSSSGGDLEITTHSF
 NCRGEFFYCNTSGLENNSLNSTSTITLPCIKIQIVRMQVRVQAMYPPIAGNITCRSNITGLLTRDGGNNNTETFRPGGDMRDNRWS
 ELYKYKIVKIKPLGVAPTRARRRVVEREKRAVGLGAVLLGFLGAAGSTMGAASITLTQVROLLSGIVQQSNLLRAIEAQHLLQLTVWGI
 KQLQARVLAVERYLKDQQLGIWGCSGKLICTTNVPWNTSWNSKSYNEIWDNMTWIEWEREISNYTOQIYSLIEESONQOEKNEQDLLALDK
 WASLWNWFDTKWLWYIKIFIMIVGGLIGLRIVFAVLSIVNRVRQGYSPLSFQTLTHHQREPRPERIEEGGGEQDKDRSIRLVSGFLALAW
 DDLRSLCLFSYHRLRDFILIAARTVELLGRSSSLKGLRLGWGLKYLWNLLLYWGQELKNSAINLLDTIAIAVANWTDREVIEVAQRACRAILN
 IPRRIRQGLERALL\$

Fig. 52A

2003 CON H Env

TRVMETQRNYPSSLWRWGTLILGMLLICSAAAGNLWVTYYGVVPWKEAKTTLFCASDAKAYETEKHNWVWATHACVPTDPNPQEMVLENTENF
 NMWENDMVEQMHDTDIISLWDQSLKPCVKLTPLCVTLNCTDVNTNNTNATNSRFNMQEELTNCSEFNVTTVIRDQKQKVHALFYRLDVVPIDNNNS
 YQYRLINCNTSVITQACPVSFEPIPIHYCAPAGFAILKCNKNTFNGTGPCTNVSTVQCTHGIRPVSTQLLNGSLAEEQVIIRSKNISDN
 TKNIIIVQLNKPVEITCTRPNNTRKSIHLGPGQAFYATGDIIGDIRQAHCVSRTKWNEMLOKVKAQLKKIFNKSSITFSSSSGGDLEITTHSF
 SFNCRGEFFYCNTSGLENNSLNSTSTITLPCRIKQIVNMWQVRVQAMYPPIKGNITCVSNITGLITLTFDEGNNTVTFRPGGDMRD
 NWRSELYKYKVVKIEPLGVAPTARRRVVEREKRAVGMGAFFLGLGAAGSTMGAASITLTQVROLLSGIVQQSNLLRAIEAQHMLQLT
 VWGIKQLQARVLAVERYLKDQQLGIWGCSGKLICTTNVPWNTSWNSKSYNEIWDNMTWMEWDKQINNNTYEEIYRLLEVSQTQOEKNEQDLL
 ALDKWASLWNWFSITNWLWYIKIFIMIVGGLIGLRIFAVLSIVNRVRQGYSPLSFQTLIPNPRGPDPRPEGIEEGGGEQDRDRSVRLVNGFL
 PLVWDDLRSLCLFSYRLLRDLILLIVVRTVELLGRRGREALKYLWNLLQYWQELKNSAINLLNTTAAIAVAEGTDRIIEIVQRAWRAILHIPR
 RIRQGFERTLL\$

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Fig. 51B

2003 CON G Env. seq. opt

ATGCGGTGAAGGGCATCCAGCGCAACTGGCAGCACCTGTGGAAGTGGGGCACCCCTGATCCTGGGCCCTGGTGATCATCTGCTCCGGCCTCCAA
CAACCTGTGGGTGACCGTGTACTACGGCGTCCCGTGTGGAGGAGCGCCGACACACCTGTGCTGCGCTCCGACGCCAAGGCTACTCCA
CCGAGCGCCACAACGTGTGGCCACCCACGCTGCGTCCCAACCGAECACACCCAGAGATCACCTGGAGAACGTGACCGAGAACTTC
AACATGTGAAGAACAAACATGGTGGAGCAGATGCACGAGACATCATCTCCCTGTGGACGAGTCCCTGAAGCCCTGCGTGAAGCTGACCCC
CCTGTGCGTGACCCCTGAACCTGACCCGACGAGTGAACGACCAACACCAACCAAGAGAGATCAAGAACTGCTCCTCTCAACA
TCACCAACCGAGATCCCGGACAAAGAAAGAGTACGCCCTGTTCACCGCTGGACGTGGTGGCCATCAACGACAAACGCAACTCCTCC
ATCTACCGCCTGATCAACTGCAACGTGTCCACCATCAAGCAGCCTGCCCAAGGTGACCTTCGACCCCATCCCCATCCACTACTGCGGCC
CGCCGGCTTCGCCATCCTGAAGTCCCGGACAAAGATTCAAGGCAACCGCCCTGCAAGAACGTGTCCACCGTGCAGTGCACCCACGGCA
TCAAGCCCGTGGTGTCCACCCAGCTGCTGTGAACGGCTCCCTGGCCGAGGAGGAGATCATCATCCGCTCCGAGAACATCACCGACAAACACC
AAGTGATCATCGTGCAGCTGAACGAGACCATCGAGATCAACTGCACCCCGCCGCAACAACACCCGCAAGTCCATCCGCATCGGCCCCGG
CCAGGCCCTTACGCCACCCGGCAGACATCATCGCGACATCCGCCAGGCCACTGCAACGTGTCCCGCACCAAGTGAACGAGATGCTGCAGA
AGGTGAAGGCCAGCTGAAGAAGATCTTCAACAAGTCCATCACTCCTCCGGCGGACCTGGAGATCACCAACCCACTCCTTC
AATGCCCGCGGAGTTCTTCTACTGCAACACCTCCGGCTGTTCACAACACTCCCTGCTGAACCTCAACCACTCCACCATCACCTGCCCTG
CAAGATCAAGCAGATCGTGGCATGTGGCAGCGGTGGCCAGCCATGTACGCCCTCCCATCGCCGGCGACATCGCGACAACTGGCGCTCCA
TCACCGCCTGCTGTGACCCCGACCGGCAACAACAACCGAGACCTTCGCCCTCCGGCGGCGACATCGCGACAACTGGCGCTCCA
GAGCTGTACAAGTACAAGATCGTGAAGATCAAGCCCTGGCGTGGCCCTCCACATGGCGCCCGCTCCATCACCTGACCTGACCGTGCAGGTGCGCC
CGTGGCCTGGCGCGCTGCTGGCTTCTGGCGCGCCGGCTCCACATGGCGCCCGCTCCATCACCTGACCTGACCGTGCAGGTGCGGCATC
AGCTGCTGCCGCGATCGTGACGACAGTCCAACTGCTGCCGCCATGAGGCCACAGACCTGCTGCGATCTGGGCTGCTCCGGCAAGCTGATG
AAGAGCTGCAGGCCCGCTGCTGGCCGTGGAGCGCTACCTGAAGGACCAAGCTGCTGGGCTGCTCCGGCAAGCTGATG
CACCAACAGTGCCTGGAAACACCTCCTGTGTCAGGAGTCCCAAGTCTTACAACGAGATCTGGGACAAATGATCGAGTGGAGCGCGAGA
TCTCCAACACTACACCCAGCAGATCTACTCCTGTATCGAGGAGTCCCAAGACCAAGCAGGAGAAAGAACGAGACCTGCTGGCCCTGGACAA
TGGCCCTCCCTGTGGAACCTGGTTCGACATCAACCAAGTGGTGTGGTACATCAAGATCTTCAATCATGATCGTGGCGGCTGATCGGCCTGG
CATCGTGTTCGCCGTGTCCATCGTGAACCGCGTGGCCAGGGCTACTCCCGCTGTCTTCCAGACCTGACCCACCAAGCGCGAGC
CCGACCGCCCGAGGCGATCGAGGAGGGCGGCGGAGCAGGACCAAGGACCGCTCCATCCGCTGGTGTCCGGCTTCTGGCCCTGGCCCTGG
GACGACCTGCGCTCCCTGTGCTGTCTCTACACCGCTGCGGACTTCACTCTGATCGCCGCCCGCAACCGTGGAGCTGCTGGCGCGCTC
CTCCCTGAAGGGCTGCGCCTGGGCTGGAGGGCTGAAGTACCTGTGGAACCTGTGCTGTACTGGGCGCAGGAGCTGAAGAACTCCGCCA
TCAACCTGTGGACACCATCGCCATCGCCGTGGCCAACTGGACCGACCGCTGATCGAGGTGGCCCGAGCGGCCCTGCCGCGCATCCTGAAC
ATCCCCCGCGCATCCGCCAGGCGCTGGAGCGGCCCTGTGTAA

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Fig. 52B

[illegible]

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Fig. 53A

2003 CON 01 AE Env

MRVKETQM^WN^WPN^LWKWGTLILGLVICSASDNLWVTYYGVPVWRDADTTLFCASDAKAHETEVHNVWATHACVPTDPNPQEIHLNVTEFN
 NMWKNMVEQM^QEDVISLWDQSLKPCVKLTPLCVTLNCTNANLTWNNTITVSNIIIGNITNEVRNCSFNMTTELDRKKQKVHALFYKLDIVQ
 IEDNNSYRLINCN^TSVIKQACP^KISFDPIPIHYCTPAGYAILKCN^DKNFNGTGPCKNVSSVQCTHG^IKPVVSTQ^LLLNGSLAEEIIIRSEN
 LTNNAKTIIIVHLNKSVEINCTRPSNNTRTSITIGPGQVFYRTGDIIGDIRKAYCEINGTKWNEVLKQVTEKLKEHFNNKTIIFQPPSGGDLE
 ITMHHFNCRGEFFYCNTTKLFNNTCIGNETMEGCNGTIIILPCKIKQIINMWQAGQAM^YAPPISGRINCVSNTGILLTRDGGANNTNETFR
 PGGGNIKDN^WRS^ELYKYKVQIEPLGIAPTRAKRRVVEREKRAVGIGAMIFGLGAAGSTMGAASITLT^VQARQLLSGIVQQQSNLLRAIEA
 QQHLLQLT^VWG^IKQ^LQARVLAVERYLKDQKFLG^WGC^SGKIICTTAVPWNSTWSNRSEFEEIWNMTWIEWEREISNTY^NQIYEILTESQNQQ
 DRNEKDLLELDK^WASLWNWFDITNWLWYIKIFIMIVGGLIGLRIIFAVLSIVNRV^RQGYSP^LSFQTPTHHQREPDRPERIEEGGEGQGRDRS
 VRLVSGFLALAWDDLRSLCLFSYHRLRDFILIAARTVELLGHSSLKGLRRGWEG^LKYLG^NLLLYWGQELKISALSLLDATAIAVAGWTD^RVI
 EVAQGAWRAILHIPRRIRQGLERALL\$

Fig. 54A

2003 CON 02 AG Env

MRVMGIQKN^YPL^LWRWGMII^FWIMII^CNAENLWVTYYGVPVWRDAETTLFCASDAKAYDTEVHNVWATHACVPTDPNPQEIHLNVTEFN
 MWKNMVEQM^QMHEDIISLWDQSLKPCVKLTPLCVTLNCTNANLTWNNTITVSNIIIGNITNEVRNCSFNMTTELDRKKQKVHALFYRLDVQINKNNSQYR
 LINCNTSAITQACP^KVSFEPIPIHYCAPAGFAILKCN^DKEFN^GTGPCKNVSTVQCTHG^IKPVVSTQ^LLLNGSLAEEIIIRSENITNNAKTI
 IVQLVKPVKINCTRPNNT^RKSVRIGPGQTFYATGDIIGDIRQAHCVSRTKWNNTIQVATQ^LRKYFNKTIIFANPSGGDLEITTHSFNCG
 GEFFYCNTSEL^FNS^TWNSTWNTEKCI^TLQCR^IKQIVNMWQKVQAM^YAPP^IOQVIRCESNITG^LLLTRDGGNNSTNETFRP^GGGDMRD^NW
 RSELYKYKVVKIEPLGVA^PTRAKRRVVEREKRAVG^LGAVFLG^LGAAGSTMGAASITLT^VQARQLLSGIVQQQSNLLRAIEAQHLLKLT^VW
 GIKQ^LQARVLALERYLKDQQLGIWGC^SGKLICTTVPWNSSWSNKT^YNDIWDNMTWLQWDKEISNYTDIYNLIEESQNQQEKNEQD^LLAL
 DKWASLWNWFDITNWLWYIKIFIMIVGGLIGLRI^VFAVLTIIINRV^RQGYSP^LSFQTLTHHQREPDRPERIEEGGEGQDRDRSVRLVSGFLAL
 AWDDLRSLCLFSYHRLRDFVLI^AARTVELLGHSSLKGLRLGWEALKYLG^NLLSYWGQELKNSAINLLDTIAIAVANWTD^RVI^EIGQ^RAGRAI
 LNIPRRIRQGLERALL\$

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Fig. 53B

2003 CON 01 AE Env. seq. opt

ATGCGCGTGAAGGAGACCCAGATGAATGGCCCCAAACCTGTGAAGTGGGGCACCCCTGATCCTGGGGCTGGTGATCATCTGCTCCGCCCTCCGA
CAACCTGTGGTGACCGTGTACTACGGCGTGGCGGACCGCGACACACCCCTGTTCTGGCCCTCCGACGCCAAGGCCACGAGA
CCGAGGTGCACAACCTGTGGGCCACCCAGCCTGCGTGGCCACCCAGACCCCAACCCCGAGGAGATCCACCTGGAGAACGTGACCGAGAACTTC
AACATGTGAAGAACAACATGGTGGAGAGATGCAGGAGGACGTGATCTCCCTGTGGGACCAAGTCCCAACATCATCGGCAACATCACCAACG
CCTGTGCGTGACCCCTGAACCTGCACCAACCGTGAACACATCAACCAACGTGTCCCAACATCATCGGCAACATCGTGACATCGTGACG
AGTGGCGCAACTGCTCTTCAACATGACCAACCGAGTGGCGACAAGAGAGAGTGCACGCCCTGTTCTACAAGCTGGACATCGTGACG
ATCGAGGACAACAACCTTACCGCCTGATCAACTGCAACACCTCGGTGATCAAGCAGGCCCTGCCCAAGATCTCCTTCGACCCCATCCCCCAT
CCACTACTGCACCCCGCGGTACGCCATCCTGAAGTGCAACGACAAGAACTTCAACGGCACCGGCCCTGCAAGAACGTCTCTCCGTGC
AGTGACCCACAGGCATCAAGCCCGTGTGTCCACCCAGCTGCTGTGAACGGCTCCCTGGCCGAGGAGATCATCATCGCTCCGAGAAC
CTGACCAACAACGCCAAGACCATCATCGTGACCTGAACAAGTCCGTGGAGATCAACTGCACCCCGCCCTCCAACAACACCCGACCTCCAT
CACCATCGGCCCGCGCAGGTGTTCTACCGCACCGCGACATCATCGCGGACATCCGCAAGGCCCTACTGGAGATCAACGGCACCAAGTGGA
ACGAGGTGCTGAAGCAGGTGACCGAGAGCTGAAGGAGCACTTCAACAACAAGACCATCATCTTCCAGCCCCCTCCGGCGGACCTGGAG
ATCACCATGCACCACTTCAACTGCCCGCGGAGTCTTCTACTGCAACACCAACCAAGCTGTTCACAACAACACCTGCATCGGCAACGAGACCAT
GGAGGGTGCACACGGCACCATCATCTGCCCTGCAAGATCAAGCAGATCATCAACATGTGGCAGGGCGCGGCCCAACACCAACGAGACCTTCCGC
CCATCTCCGGCCGATCAACTGCGTGTCCAAACATCACCGGATCTCTGTACCCCGGACCGCGGCCCAACACCAACGAGACCTTCCGC
CCCGCGCGGCAACATCAAGGACAACCTGGCGTCCGAGCTGTACAAGTACAAGTGTGTCAGATCGAGCCCTGGGCATCGCCCCACCCG
CGCCAAGCGCGCGTGGAGCGCGAGAGCGCGCGTGGCATCGCGCCATGATCTTCGGCTTCTGGCGCGCGCGCTCCACCATGG
GCGCGCCTCCATCACCTGACCGTGCAGGCCCGCCAGCTGCTGTCCGGCATCGTGACGACGATCCAACCTGCTGCGCGCCATCGAGGCC
CAGCAGCACCTGCTGCAGCTGACCGTGTGGGGCATCAAGCAGTGCAGGCCCGCGTGTGGCGGTGAGCGGTACCTGAAGGACCAAGATT
CCTGGGCCCTGTGGGCTGCTCCGGCAAGATCATCTGCACCAACCGCGTGGCCCTGGAATCCACCTGGTCCAAACCGCTCCTTCGAGGAGATCT
GGAACAACATGACCTGGATCGAGTGGGAGCGCGAGATCTCCAACATCAACCAACAGATCTACGAGATCTGACCGAGTCCCGAGAACCGAG
GACCGCAACGAGAAGACCTGCTGGAGCTGGACAAGTGGCCCTCCCTGTGGAACCTGGTTCGACATCAACCAACTGGCTGTGGTACATCAAGAT
CTTCATCATGATCGTGGCGCCTGATCGGCCCTGCGCATCATCTTCCCGCTGCTGTCCATCGTGACCGGCGGCGGAGGCGGCTACTCCCCC
TGTCCTTCCAGACCCCAACCAACCGAGCGGACCGCCCGAGCGCATCGAGGAGGCGGCGGCGGAGGCGGCGGAGGCGGCGGCTCC
GTGCGCCTGGTGTCCGGCTTCTGGCCCTGGCGACGACCTGCGCTCCCTGTGCTTCTCTACACCGCTGCGGACTTCATCCT
GATCGCGCGCGACCGTGGAGTGTGGGCCACTCCTCCCTGAAGGGCTGCGCGCGGCTGGAGGGCTGAAGTACCTGGGCAACCTGC
TGCTGTACTGGGCGCAGGAGTGAAGATCTCCGCCATCTCCCTGCTGGACGCCACCGCCATCGCCGTGGCGGCTGGACCGGCGTGATC
GAGGTGGCCCGCGCGCTGGCGCGCATCTCCCGCGCATCCCGCAGGSCCTGGAGCGCGCTGCTGTAA

Fig. 54B

2003 CON 02 AG Env.seq.opt

ATGCGCGTGATGGGCATCCAGAAGAACTACCCCTGCTGTGGCGCATGATCATCTTCTGGATCATGATCATCTGCAACGCCGAGAA
CCTGTGGGTGACCGTGTAACGGCGTGCCCGTGCGGACGCCGAGACCACTGTTCTGCGCCTCCGACGCCAAGCCTACGACACCG
AGGTGCACAACGTTGGGCCACCCACCGCTGCGTGCCACCGAACCCCAAGAGATCCACTGGAGAACGTAACCGAGAACTTCAAC
ATGTGAAGAACAACTGGTGAGCAGATGACGAGGACATCATCTCCCTGTGGACCACTCCCTGAAGCCTCGTGAAGCTGACCCCTT
GTGCGTGACCTGGACTGCCACAACAATCAACATCCAACTCCAAACACCAACGCGGCGAGATCAAGAACTGCTCTTCAACATGA
CCACGAGCTGCGGCAAGAAGCAGAGGTGTACGCCCTGTTACCGCCTGGACGTGGTGAGATCAACAAGAACTCCAGTACCCG
CTGATCAACTGCAACACTCCCGCATACCCAGGCTGCCCAAGGTGCTTCTGAGCCCATCCCATCTACTGCGCCCCCGCGGCTT
CGCCATCCTGAAGTCAACGACAGGAGTTCAACGGCACCGGCCCTGCAAGAACGTGTCCACCGTGAGTGCAACCAAGCATCAAGCCG
TGGTGTCCACCCAGCTGTCTGAACGGTTCACCGGACCGGCCCTGCAAGAACGTGTCCACCGTGAGTCAACCAACGCAAGCCG
ATCTGCGAGCTGGTGAAGCCCGTGAAGATCAACTGCACCCGCCCAACAACAACCCGAAAGTCCGTGGCATCGGCCCGCCAGACCTT
CTAGCCCAACCGGACATCATCGCGACATCCGCCAGGCCACTGCAACGTGTCCGCAACCAAGTGAACAACACCCCTGCAGCAGGTGGCCA
CCCAAGTCCGCAAGTACTTCAACAAGACCATCATCTTGCCCAACCCCTCCGGCGGAGACCTGGAGATCAACACCCACTCCTTCAACTGCGGC
GGCGAGTTCTTACTGCAACACTCCGAGCTGTTCAACTCCACTGGAACCTCCACTGGAACAACACCGAGAAAGTGATCACCCCTGCAGTG
CCGATCAAGCAGATCGTGAACATGTGGCAGAGGTGGCCAGGCCATGTACGCCCCCCCATCCAGGGCGTGATCCGCTCGAGTCCAACA
TCAACGGCCTGCTGTGACCCCGACGGCGCAACAACACTCCAAACGAGACCTTCCGCCCCCGCGGCGAGCATGCGCGACAACACTGG
CGCTCCGAGCTGTACAAGTACAAGTGGTGAAGATCGAGCCCCTGCGGTTCCTGGGTTCCTGGCGCCGCTGCTCATCACTGAGCGTGCAG
GCGCGCCGTGGCCTGGCGCCTGGCGCCTGAGCAGTCAACCTGCTGCGGCCATCGAGGCCACGAGCACTGCTGAAGCTGACCGTGTGG
CCCGCAGCTGCTGTCCGGCATCGTGAGCAGTCAACCTGCTGCGGCCATCGAGGCCACGAGCACTGCTGAAGCTGACCGTGTGG
GGCATCAAGCAGTGCAGGCCCGCGTGTGGCCCTGAGCGCTACTGAAGGACCGAGCTGCTGGGCATCTGGGCTGCTCCGGCAAGCT
GATCTGCACCACCAACCGTGCCCTGGAACCTCCTCTGTTCCAAAGACCTACAAGCATCTGGACAAACATGACCTGGCTGAGTGGGACA
AAGGAGATCTCCAACATACCCGACATCATACAACCTGATCGAGGAGTCCAGAACCCAGCAGGAGAAACGAGGACCTGCTGGCCCCTG
GACAAAGTGGCCTCCCTGTGGAACCTGTTGACATCAACCACTGGCTGTGTTACATCAAGATCTTCACTTCAGACCTGACCCACCAAGC
CCTGCGCATCGTGTTCGCCGTGCTGACCATCATCAACCGCTGCGCCAGGGCTACTCCCCCTGTCTTCAGACCTGACCCACCAAGC
GGGAGCCCGACCCCGAGCGCATCGAGGAGGGCGGCGAGCAGGACCGCTCCGTGCGCCTGGTGTCCGCTGATCGCCCGCCGAGCTGCTGG
GCCTGGGACGACCTGCGCTCCCTGTGCTTCTCTACCAACCGCTTCCGCGACTTCGTGCTGATCGCCCGCCGAGCTGCTGGCCTG
CCACTCCTCCTGAAGGCCCTGCGCCTGGCTGGGAGGCCCTGAAGTACCTGGCAACCTGCTGTCTACTGGGCGCAGGAGCTGAAGAACT
CCGCCATCAACCTGCTGGACACCATCGCCGTGGCCAACTGGACCGACCGGTGATCGAGATCGGCCAGCGCGCGGCCCATC
GTGAACATCCCCCGCGCATCCGCCAGGCCCTGGAGCGCGCCCTGCTGTAA

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Fig. 55A

2003 CON 03 AB Env

MRVKEIRKHLRWGTLFLGMLMICSATENLWVTYYGVVPVWKEATTLFCASDAKAYSKEVHNWATYACVTPDPSPQEIPLENVTFNMG
 KNNMVEQMHEDIISLWDQSLKPCVKLTPLCVTLNCTDLKKNVTSTNTSSIKMMEMKNCSENIITDLRDKVKKEYALFYKLDVVQIDNDSYRL
 ISCNTSVVTQACPKISFEPIPIHYCAPAGFAILKCNDDKKFNGTGPCNTVSTVQCTHGKIPVSTQLLNGSLAAEEVVIRSVNFTDNTKTII
 VOLKEPVEINCTRPNNTRKGIHIGPGRAFYATGDIIGDIRQAHCNISITKWNNTLKQIVIKLRKQFGNKTIVFNQSSGGDPEIVMHSFNCG
 GEFFYCNTTKLFNSTWNGTEELNTEGDIVTLPCRKQIINMWQEVGKAMYAPPIAGQIRCSSNITGLLLTRDGGNQSNTVEIFRPGGGDMR
 DNWRSELYKYKVVKIEPLGVAPTKAKRRVQREKRAVGIGAVFLGELGAAGSTMGAASITLTVOARQLLSGIVQQQNNLLRAIEAQHLLQL
 TVWGIKQLOARVLAVERYLKDQOLLGIWCGSKLICTTAVPWNTSWNSKSLDEIWNNTWMEWEREINNYTGLIYNLIEESQNQOEKNEQEI
 LALDKWASLWNWFDISKWLWYIKIFIMIVGGLVGLRIIFAVLSIVNRVRQGYSPLSFQTRLPTQRGPDREGEIEEGGERDRDTSIRLVNGF
 LALIWDRLSLCLFIYHHLRDLILLIARIVELLGRRGWEALKYWNLLQYWIQELKSSAINLIDTIAIAVAGWTDRIEIGQREFCRAIRNIP
 RRIRQGAEKALQ\$

Fig. 56A

2003 CON 04 CPX Env

MRVMGIQRNYPHLWENGTLILGLVICSASKNLWVTYYGVVPVWRDAETTPFCASDAKAYDKEVHNWATHACVTPDPNPQEIALKNVTFENF
 NMWKNMVEQMHEDIISLWDEGLKPCVKLTPLCVALNCSNATINNSTKTNSTEIEIKNCSENIITEIRDKKKKEYALFYRLDIVPINDSANN
 SINSEYMLINCNASTIKQACPVTFEPIPIHYCAPAGFAILKCNDDKNFTGLGPCNTVSSVQCTHGKIPVSTQLLNGSLATEGVVIRSKNF
 TDNTKNIIVQLAKAVKINCTRPNNTRKSVHIGPGOTWYATGEIIGDIRQAHCNISGNDWNETLOKIVEELRKHFPNKTIIIFAPSAGGDLEI
 TTHSFNCGGEFFYCNTSELFNSTYMNSTNTINKTITLPCRKQIIVSMWQEVGQAMYAPPIAGSINCSSDITGIILTRDGGNNTNNETFR
 PGGGDMRDNWRSELYKYKVVKIEPVGVAPTRARRRVQREKRAVGIGAVFLGELGAAGSTMGAASITLTVOARQLLSGIVQQQNNLLRAIEA
 QQHLLRLTVWGIKQLOARVLALESYLDQOLLGIWCGSKLICTTNVPWNSSWSNKSINDWDMTWLQWDEINNYTQIIEELLEESQNQQ
 EKNEQDLLALDKWANLWNWFNISNWLWYIKIFIMIVGGLIGLRIIFAVLSIVNRVRQGYSPLSLQTLIPTQRGPDREGEIEEGGERDRSR
 SIRLVNGFLPLIWDRLNLCFSYRHLRNLILLIVARTVELLIGIRGWEALKYLWNLLLYWGQELRNSAINLIDTTAIAVAEGTDRIIEAVQRA
 CRAIRNIPRRIRQGLERALL\$

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Fig. 55B

2003 CON 03 AB Env. seq. opt

ATGCGCGTGAAGGAGATCCGCAAGCACCTGTGGCGCTGGGGACCCCTGTCTCTGGGCATGCTGATGATCTGCTCGGCCACCGAGAACCTGTG
GGTGACCGTGTACTACGGCGTCCCCGTGTGAAGGAGGCCACCAACACCTGTCTGCGCTCCGAGCCCAAGGCCTACTCCAAGGAGGTGC
ACAACGTGTGGGCCACCTACGCTGCGTGCACCCGACCCCTCCCGCCAGGAGATCCCGCTGGAGAACGTGACCCGAGAACTTCAACATGGGC
AAGAACAAATGGTGGAGCAGATGCACGAGGACATCATCTCCCTGTGGGACCACTCCCTGAAGCCCTGCTGAAGCTGACCCCTGTGCGGT
GACCTGAAGTGCACCGACCTGAAGAGAACGTGACCTCCACCAACACCTCTCCATCAAGATGATGGAGATGAAGAACTGCTCTTCAACA
TCACACCGACCTGCGCGACAAGGTGAAGAGGAGTACGCTGTTCTACAAGTGGACGTGGTGCAGATCGAACACGACTCCTACCGCTG
ATCTCCTGCAACACCTCCGTGGTGACCCAGGCTGCCCCAAGATCTCTTCGAGCCCCATCCCCATCCACTACTGCGCCCCCGCGGCTTCGC
CATCCTGAAGTGCACGACCAAGATTCAACGGCACCGGCCCTGACCAACGTGTCCACCGTGCAGTGCACCCACGGCATCAAGCCCCGTGG
TGTCCACCCAGCTGTGTAACGGCTCCCTGGCCGAGGAGGTGGTGTCCGCTCCGTGAATTCACCGAACACCAAGACCATCATC
GTGAGCTGAAGGAGCCCCGTGGAGATCAACTGCACCCGCCCAACAAACACCCGCAAGGCATCCACATCGGCCCGCGCCCTTCTA
CGCCACCGCGGACATCATCGCGGACATCCGCCAGGCCACTGCAACATCTCGATCACCAAGTGGAAACAAACCCCTGAAGCAGATCGTGATCA
AGCTGGCAAGCAGTTCGGCAACAAGACCATCGTGTTCACCAAGTCTCCGGCGGACCCCGAGATCGTGATGCACTCCTTCAACTGCGGC
GGCGAGTCTTCTACTGCAACACCAACCAAGCTGTTCACCTCCAGTGAACGGCACCGAGGAGTGAACAAACACCGAGGGCGACATCGTGAC
CCTGCCCTGCCGATCAAGCAGATCATCAACATGTGGCAGGAGGTGGCAAGGCCATGTACGCCCCCCCATCGCCGCCAGATCCGCTGCT
CCTCCAACATCACCGGCTGTGCTGACCCGAGCGGCAACCAAGTCCACGTGACCGAGATCTCCGCCCGCGCGGCGGACATGCGC
GACACTGGCGCTCCGAGCTGTACAAGTACAAGGTGGTGAAGATCGAGCCCCCTGGCGGTGGCCCCCAACCAAGGCCCAAGCGCGTGGTGA
GCGGAGAAAGCGCGCTGGCATCGGCGCGTGTCTCGGCTTCTGGCGCGCGGCTCCACCATGGGCGCCCAAGGCCCAAGCGCGTGGTGA
CCGTGCAAGCGCGCATCGTGTCCGGCATCGTGACGACGAGAACCAACCTGCTGCGCGCCCATCGAGGCCAGCAGCACCTGCTGCAGCTG
ACCGTGTGGGGCATCAAGCAGCTGCAGGCCCGGTGCTGGCGGTGGAGCGCTACCTGAAGGACCAAGTGTGGGCATCTGGGGCTGCTC
CGGCAAGCTGATCTGCACCAACCGCGTGCCCTGGAACACCTCCTGGTCCAACAAGTCCCTGGACGAGTCCAGAACCAACATGACCTGGATGG
AGTGGGAGCGGAGATCAACAATAACCGGCTGATCTACAACCTGATCGAGGAGTCCAGAACCAAGCAGGAGAGAACGAGCAGGAGATC
CTGGCCCTGGACAAGTGGCCCTCCCTGTGGAATGGTTCGACATCTCCAAGTGGTGTGGTACATCAAGATCTTCATCATGATCGTGGCGG
CCTGGTGGCCCTGGCATCATCTTCGCGTGTCCATCGTGACCGCGTGGCGGAGGCTACTCCCCCTGTCTTCCAGACCGCGCTGC
CCACCCAGCGCGCCCGACCGCCCGAGGGCATCGAGGAGGAGGGCGGAGCGGACCTCCATCCGCTGGTGAACGGCTTC
CTGGCCCTGATCTGGGACGACCTGCGCTCCCTGTGCTTCACTACCAACCTGCTGCGGACCTGCTGTGATCGCCCGCGCATCGTGGA
GCTGCTGGCGCGCGCGCTGGAGGCGCTGAAGTACTGTGGAACCTGCTGCAGTACTGGATCCAGGAGTGAAGTCTCCGCCATCAAC
TGATCGACACCATCGCCATCGCCGTGGCCGGCTGGACCGGCTGATCGAGATCGGCCAGCGCTTCTGCCGCGCATCCGCAACATCCCC
CGCCGCATCCGCCAGGGCGCGGAGAGGCCCTGCAGTAA

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Fig. 56B

2003 CON 04 CPX Env. seq. opt

ATGCGCGTATGGGATCCAGCGCAACTACCCCACTGTGGAGTGGGGACCCCTGATCCTGGGCTGTGATCATCTGCTCCGCTCCAA
GAACCTGTGGTGACCGTGACTACGGCGTACCGCGAGAGAGACACCCCTTCTGGCTCCGACGCCAAGGCTACGACA
AGGAGGTGCACAACATCTGGCCACCCACCGCTGGTCCCAACCGACCCCAAGAGATGCCCCGAAGAACGTGACCGAGAACTTC
AACATGTGAAGAACAACATGGTGGAGCAGATGCACGAGACATCATCTCCCTGTGGACGAGGGCTGAAGCCCTGCGTGAAGCTGACCCC
CCTGTGCGTGGCCCTGAACCTGCTCCAAAGCCAGCATCAACAACCAAGACCAACTCCACCGAGGAGATCAAGAACTGCTCTTCAACA
TCACCAACCGAGATCCGCGACAAGAAGAGAGTACGCCCTGTCTACCGCTGGACATCGTGCCCATCAACGACTCCGCCAACAAAC
TCCATCAACTCCGAGTACATGCTGATCAACTGCAACGCTCCACCATCAAGCAGGCTGCCCCAAGTGACCTTCGAGCCCATCCCCATCCA
CTACTGCCCCCGCGGCTTCGCCATCCTGAAGTGCAACGACAAGAACTTCAACGGCTGGSCCTGACCAACAGTGTCTCCGTGAGT
GCACCAACGAGCATCAAGCCCGTGTGTCACCCAGCTGCTGTGAACGGCTCCCTGGCCACCGAGGGCTGGTGTCCGTCCAAAGAACTTC
ACCGAACACCAAGAACATCATCTGTCAGCTGGCCAAAGCCGTGAAGATCAACTGCACCCCGCCCAACAACACCCGAACTCCGTGCA
CATCGCCCCCGGCGAGACCTGGTACGCCACCGCGAGATCATCGCGGACATCCGCCAGGCCACTGCAACATCTCCGCAACGACTGGAACG
AGACCTGCAGAAGATCGTGAGGAGCTGCGCAAGCACTTCCCCAACAGAACCATCATCTTCGCCCTCCGCCGCGGACCTGGAGATC
ACCACCACTCCTTCAACTGCGCGGGGAGTCTTCTACTGCAACACCTCCGAGCTGTTCAACTCCACCTACATGAATCCACCACTCCAC
CACCATCAACAAGACCATACCCCTGCCCTGCCATCAAGCAGATCGTGTCCATGTGGGAGGAGTGGCCAGGCCATGTACGCCCCCCCA
TCGCCGCTCCATCAACTGCTCCTCCGACATCACCGCATCATCTGACCCCGACGGCGCAACAACAACAGACCTTCCGC
CCCGCGCGCGACATGCGGACAACCTGGCGCTCCGAGCTGTACAAGTACAAGTGTGAAGATCGAGCCCGTGGCGTGGCCCCACCCG
CGCCCGCGCGCTGTCAGCGCGAGAACCGCGCGTGGCATCGCGCCGTCTTCTGGCTTCTGGCGCGCGCTCCACCATGG
GCGCGCTCCATCACCTGACCGTGCAGCGCCCGCAGCTGTGTCCGCACTGTGACGACAGTCCAACTGCTGCGCGCATCGAGGCC
CAGCAGCACTGCTGCGCTGACCGTGTGGGCACTCAAGCAGTGCAGCCCGCTGGAGTCCCTACCTGAAGGACCAAGCT
GCTGGGCATCTGGGCTGCTCCGCAAGCTGATCTGCACCAACGTCGCCCTGGAACCTCCTCTGGTCCAAACAAGTCTTACACGACATCT
GGACAACATGACCTGGCTGCAGTGGACAAGGAGATCAACAACATACCCAGATCATCTACGAGCTGTGGAGGAGTCCAGAACCAAGCAG
GAGAAGAACGAGGACCTGTGGCCCTGGACAAGTGGCCAACTGTGGAACCTGGTCAACATCTCCAACTGGTGTGGTACATCAAGAT
CTTCATCATGATCGTGGCGCTGATCGGCTGCGCATCATCTTCGCCGTGTCTCCATCGTGAACCGGTGGCCAGGGCTACTCCCCC
TGTCCTGCAGACCTGATCCCAACCAAGCGGCCCGACCGCCCGAGGGCACCGAGGAGGAGGGCGGCGAGCAGCCGCTCCCCG
TCCATCCGCTGGTGAACGGCTTCTGCCCTGATCTGGACGAGCTGGCAACCTGTGCTGTCTCTACCGCCACCTGCGCAACCTGCT
GCTGATCGTGGCCCGACCGTGGAGCTGTGGCATCCGCGCTGGAGGCCCTGAAGTACCTGTGGAACCTGTGCTGTACTGGGGCCAGG
AGTGGCAACTCCGCCATCAACCTGTGGACACCAACCGCATCGCCGTGGCCGAGGACCGCATCATCGAGGCCGTGACGGCGCC
TGCCGGCCCATCCGCAACATCCCGCGCATCCGCCAGGCTGGAGCGCGCTGCTGTAA

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Fig. 57A

2003 CON 06 CPX Env

MRVKGIQK^WQHLWKWGTLLIGLVIICSASNNMWTVYYGVPAWEDADTILFCASDAKAYSAEKHNWVWATHACVPTDPNPQEI^ALENVTENF
 NMWKNHMVEQM^HEDIISLWDESLKPCVKLTPLCVTLNCTNVTKNNNTKIMGREEIKNCSEFNVTEIRDKKKKEYALFYRLDVVPIDDNNNSY
 RLINCNASTIKQACPKVSFEPIPIHYCAPAGFAILKCRDKNFNGTGPCKNVSTVQCTHGKIPVSTQLLNGSLAE^EII^IIKSENLT^DNTKT
 IIVQLNKSVEIRCTRPNNNTRK^SISFGPGQAFYATGDIIGDIRQAHCVSR^TDWNNMLQNV^TAKLKE^LFNKNIT^FFNSSAGG^DLEIT^HSFNC
 GGEFFYCNTS^QLENSTRPNETNTITLPC^KIKQIVRMWQ^RVGQAM^YAPPIAGNIT^CTSNITGL^LTRDGNNDSE^TFRPGGDMRON^WRS^ELY
 KYVVKIKPLGIA^PTRARRRVVGREKRAVGLGAVFLGTAGSTMGAASITLT^VQVRQLSGIVQ^QSNLLRA^EAQ^QHLLQ^LTVWG^IKQL
 QARVLAVERYLKDQQLGIWGC^SGKLICPTNVPWNAS^WSNKTYNEI^WDNMTWIE^DREINNYTQ^IYSLIE^SQ^QQEKNEQ^DLLALD^KWAS
 LWSWFDISNWLWYIKIFIMIVGGLIGLRIVFAVLSIVNRV^RQGYSP^LSLQTLIPNPTGAD^RPGEIEEGGEGQ^RTRSIRLVNGFLALAW^DDL
 RSLCLFSYHRLRDFVLIAARTVETLGH^RGWEILKYLGNLVCYW^GQELKNSAISLLDTTAAVANWTDRVIEV^VQRVFRAFLNIPRRIRQ^GFE
 RALL^S

Fig. 58A

2003 CON 08 BC Env

MRVRGTRRNYQ^QWMIWGVLMICNVEGNLWTVYYGV^PVWKEAKTTLFCASDAKAYETE^VHNVWATHACVPTDPNPQEI^VMENV^TENF
 NMWNNDMVNQM^HEDVISLWDQSLKPCVKLTPLCVTLECTNVSSNGTYNETYNESVKEIKNCSEFNATLLRDRKKTVYALFYRLDIVPLND
 ENSGKNSSEYYRLINCNTSAITQACPKVTFDPIPIHYCTPAGYAILKNDKKFNGTGQCHNVSTVQCTHGKIPVSTQLLNGSLAE^EII^I
 RSENLTNNVKTIIVHLNQSVEIVCTRPNNNTRK^SIRIGPGQTFYATGDIIGDIRQAHCVSR^TDWNNMLQNV^TAKLKE^LFNKNIT^FFNSSAGG^DLEIT^HSFNC
 GDEIT^HSFNCRGEFFYCNTSGLFNGTYMNGTNNSSSIITIPCR^IKQIINMWQEVGRAMYAPPIEGNITCKSNITGLLLVRDGGRTESNNT
 EIFRPGGDMRNNWRNELYKYVVEIKPLGVAPTAAKRRVVEREKRAVGLGAVFLGELGAGSTMGAASITLT^VQARQLSGIVQ^QSNLLR
 AIEAQ^QHMLQLTVWG^IKQLQTRVLAIERYLKDQQLGIWGC^SGKLICTTAVPWNSSWSNKSQ^QEIWDNMTW^QWDKEISNYTNTIYRLLED^S
 QNQQERNEKDLLALDSWKNLWSWF^DITNWLWYIKIFIMIVGGLIGLRIIFAVLSIVNRV^RQGYSP^LSLQTLIPNPTGAD^RPGEIEEGGEGQ^R
 KTRSIRLVNGFLALAWDDLRNLC^LFSYHRLRDFILLTARGVELLGRNSLRGLQ^RGWEALKYLGLSVQYWG^LE^LKKSTISLVD^TIAIAVAEGT
 DRIINIVQGICRAIHNI^PRRIRQGEAALQ^S

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Fig. 57B

2003 CON 06 CPX Env.seq.opt

ATGGCGGTGAAGGCATCCAGAAGAACTGGCAGCACTGTGGAAGTGGGGCACCTGTATCCTTGGGCTGTGTATCATCTGCTCCGCTCCAA
CAACATGTGGTGACCGTGTACTACGGCTGCCGCTGGAGGACGCCGACACCATCTGTCTCGCTCCGACGCCAAGGCTACTCCG
CCGAGAAGCACAACTGTGGCCACCCACGCTGCTGCCACCCGACCCCAACCCCGAGGAGATCGCCCTGGAGAACTGACCCGAGAACTTC
AAACATGTGGAAGAACCAACATGTTGGAGCAGATGCAGGAGCATCATCTCCTGTGGACGAGTCCCTGAAGCCCTGCGTGAAGCTGACCCC
CCTGTGCGTGACCTGAACCTGCACCAACGTGACCAAGAACAAACACCAAGATCATGGCCGCGAGGAGATCAAGAACTGCTCTTCAACG
TGACCACCGAGATCCGGACAAGAAGAGGATACGCCCTGTCTACCGCTGGACGTGGTCCCATCGACGACAACAACAACCTCTAC
CGCCTGATCAACTGCAACGCTCCACCATCAAGCAGGCTGCCCAAGTGTCTTCGAGCCCATCCCATCCACTACTGCGCCCCCGCGG
CTTCGCCATCCTGAAGTGGCCGACAAGAACTTCAACGGCACCGGCCCTGCAAGAACGTGTCCACCGTGCAGTGCAACCCACGGCATCAAGC
CCGTGGTGTCCACCCAGCTGCTGTGAACGGCTCCTTGGCCGAGGAGGAGATCATCATCAAGTCCGAGAACCTGACCCGACAACACCAAGACC
ATATCATGTGACGTGAACAAGTCCGTGGAGATCCGTGCACCCGCCCAACAACACCCGACCTGAACTCCATCTCCTTCGGCCCCGGCCAGG
CTTCTACGCCACCGGCACATCATCGCGACATCCGCCAGGCCACTGCAACGTGTCCCGACCCGACCTGGAACAACATGCTGCAGAACGTGA
CCGCCAAGCTGAAGGAGTGTTCACAACAAGAACATCACTTCAACTCCTCCGCCGGCGGACCTGGAGATCACCAACCATCTCTTCAACTGC
GGCGGCGAGTTCTTCTACTGCAACACCTCCAGCTGTTCAACTCCACCCGCCCAACAGAGAACCAACCATCACCTGCCCTGCAAGATCAA
CGAGATCGTGGCATGTGGCAGCGGTGGGCCAGGCCATGTACGCCCCCCCATCGCCGGCAACATCACTGCACTTCCAACTCACCGGCC
TGCTGCTGACCCCGCAGCAACAACGACTCCGAGACCTTCGCCCCGGCGGCGGACATCGCGCAACTGGCGCTCCGAGCTGTAC
AAGTACAAGTGGTGAAGATCAAGCCCTGGGCATCGCCCAACCGCGCCCGCGCTGGTGGCGCGGAGAACGCGCGCTGGGCTT
GGCGCGCGTGTCTTGGGCTTCTTGGGCAACCGCGCTCCACCATGGCGCCGCTTCATCACCTGACGCTGAGGTGCGCCAGCTGCTGT
CCGGCATCGTGCAGCAGCAGTCCAACCTGTGTGGCGCCATCGAGGCCAGCAGCACTGCTGCAGCTGACCGTGTGGGCACTCAAGCAGCTG
CAGGCCCGCTGTGGCCGTGAGCGCTACCTGAAGGACCAGCAGCTGTGGGCATCTGGGCTGTCTGGCAAGCTGATCTGCCCCACCCAA
CGTGCCCTGGAACGCCCTCTTGTTCAAACAAGACCTACAACGAGATCTGGGACAACATGACCTGGATCGAGTGGGACCCGCGAGATCAACAAC
ACACCCAGCAGATCTACTCCTGTATCGAGGAGTCCAGAACCCAGCAGGAGAAGAACGACGAGACCTGCTGGCCCTGGACAAGTGGGCCCTC
CTGTGGTCTCTGTTCCACATCTCCAATGGCTGTGTTACATCAAGATCTTCATCATGATCGTGGCGGCTGATCGGCCCTGCGCATCGTGT
CGCCGTGCTGTCCATCGTGAACCGCGTGGCCAGGCTACTCCCCCTGTCCCTGCAGACCCCTGATCCCCAACCCCAACGGCGCCGACCGCC
CCGGCGGAGATCGAGGAGGGCGGCGAGCAGGGCCGACCCGCTCCATCCGCTGTTGAACGGCTTCTTGGCCCTGGCTGGGACGACCTG
CGCTCCCTGTGCTTCTTACCAACCGCTGCGGACTTCGTGCTGATCGCCGCCCGCACCCGTGGAGACCTTGGGCCACCGCGGCTGGGA
GATCTGAAGTACCTGGGCAACCTGTTGCTACTGGGGCCAGGAGCTGAAGAACTCCGCCATCTCCTGCTGGACACCAACCGCCATCGCCG
TGGCCAACCTGGACCGCACCGCTGATCGAGGTGGTGCAGCGCTGTTCGCCGCTTCTCTGAACATCCCCCGCGCATCCGCCAGGGCTTCGAG
CGCGCCCTGCTGTAA

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Fig. 59A

2003 CON 10 CD Env

MRVMGIQRNCQWIIWILGEFWMIMICNATGNLWTVVYGVVPWKETTTLFCASDAKAYKAEAHNIWATHACVPTDPNPQEIVLENVTENF
 NMWKNMGVDMQMHEDIISLWDQGLKPCVKLTPLCVTLNCSVDNATNSATNTVAGMKNCNFNITTEIRDKKKQYALFYKLDVVQIDGSNTSY
 RLINCNTSAITQACPKVTFEPIPIHYCAPAGFAILKNDKKFNGTGPCKNVSTVQCTHGKIPVSTQLLNGSLAEIEIIIRSENLTDNAKT
 IIVQLNESVTINCTRPNNNTRKSIIRIGPGQTFYATGDIIGNIRQAYCNISGTEWNKTLOQVAKKLGDLNKTIIIFKPSSGGDPEITTHTFN
 CGGEFFYCNTSKLFNSSWTSNNTGNTSTITLPCRKQIINMWQGVGKAIYAPPIAGLINCSSNITGLLLTRDGGANNSETFRPGGGDMRDNW
 RSELYKYKVVKIEPLGLAPTAKARRVVEREKRAIGLGAAGSTMGAASTLTVOARQLLSGIVQQNNLLRAIEAQHLLQLTVW
 GIKQLQARVLAVESYLDQQLLGIWCGSGKHICTTNVPWNSSWSNKSLEEIWDNMFTWMEWEREIDNYTGLIYSLIEESQNOQEKNEQELLQL
 DKWASLWNWFSITNLWYIKIFIMIVGGLIGLRIVFAVLSLVNRVRQGYSPLSFQTLPPAPRGPDRPEGIEEGEGQGRSIRLVNGFSAL
 IWDDLRLNCLFSYHRLRDLILIAATRIVELLGRRGWEAIKYLWNLQYWIQELKNSAISLLDTTAIAVAEGTDRAIEIVQRAVAVLNIPTRI
 RQGLERALL\$

Fig. 60A

2003 CON 11 CPX Env

MRVKETQRNWHNLWRWGLMIFGMLMICNATENLWTVVYGVVPWKDADTTTLFCASDAKAYSTEKHNWATHACVPTDPNPQEIVLENVTENF
 NMWKNNMVEQMHEDIISLWDESLKPCVKLTPLCVTLNCTDVKNATNTTVEAAEIKNCNFNITTEIKDKKKQYALFYKLDVVPINDNNNSIY
 RLINCNVSTVKQACPKVTFEPIPIHYCAPAGFAILKNDKKFNGTGPCKNVSTVQCTHGKIPVSTQLLNGSLAEIEVIRSENFTNNAKT
 IIVQLNSSVRINCTRPNNNTRKSIHIGPGQAFYATGDIIGDIRQAHCNISRAEWNNTLOQVAKQLRENFNKTIIFNNPSGGDLEITTHSFNC
 GGEFFYCNTSRLFNSTWNNDTRNDTKQMHITLPCRKQIIVNMWQVRVQAMYPPIQKIRCNSTITGLLLTRDGGNNNTNETFRPTGGDMRD
 NWRSELYKYKVVEIKPLGVAPTRAKRRVVEREKRAVGIGAVLLGFLGAAGSTMGAASITLTVOARQLLSGIVQQNNLLKAEIAEQHLLKLT
 VMGIKQLQARVLAVERYLKDQQLLGIWCGSGKLICTTNVPWNFSWSNKSDEIWDNMFTWIEWEREINNYTQTYTLLEESQNOQEKNEQDLL
 ALDKWASLWNWFDISNLWYIKIFIMIVGGLIGLRIIFAVLSIVNRCRQGYSPLSFQTLTPNHKEADRPGGIEEGGEGQDRTRSIRLVSGFL
 ALAWDDLRLNCLFSYHRLRDFILIAARIVETLGRRGWEILKYLGNLAQYWGQELKNSAISLLNATAIAVAEGTDRIIEVVHRLRAILHIPR
 RIRQGFERALL\$

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Fig. 61A

2003 CON 12 BF Env

MRVRGMQRNQHGLGKWLFLGLIICNATENLWVTYYGVPVWKEATTLFCASDAKSYEREVHNWVATHACVPTDPNPQEVLENVTENF
 DMWKNMVEQMHTDIIISLWDQSLKPCVKLTPLCVTLNCTDANATANATKEHPEGRAGAIQNCSEFNMTTEVRDKQMKVQALFYRLDIVPISDN
 NSNEYRLINCNTSTITQACPKVSWDPIPIHYCAPAGYAILKCNCKFNGTGPCKNVSTVQCTHGKIPVSTQLLNGSLAEIEEIIIRSONIS
 DNAKTIIVHLNESVQINCTRPNNNTRKSIHIGPGRAFYATGDIIGDIRKAHCNVSGTQWNKTLEQVKKLRSYFNTTIKENSSSGGDPPEITM
 HSFNCRGEFFYCNTSKLFNDTVSNDTIILPCRIKQIVNMWQEVGRAMYAAPIAGNITCTSNITGLLLTRDGGHNETNKTETFRPGGNNMKDN
 WRSLEYKYKVEIEPLGVAPTRAKRQVVKREKRAVGIGALFGLGAAGSTMGAASITLTVOARQLLSGIVQQSNLLRAIEAQHLLQLTV
 WGIKQLOARVLAVERYLKDQQLGLWGCSGKLICTTNVPWNSSWSNKSQEEIWENMTWMEWEKEINNYSNEIYRLIEESQNOQEKNEQELLA
 LDKWASLWNWFDISNWLWYIRIFIMIVGGLIGLRIVFAVLSIVNRVRKGYSPLSLQTHIPSPREPDRPEGIEEGGEGQKDRSVRLVNGFLA
 LIWDDLRSLCLFSYHRLRDLILLIVTRIVELLGRRGWEVLKYWNLLQYWSQELKNSAISLLNTTAIVVAEGTDRVIEALQRVGRAILNIPRR
 IRQGLERALL\$

Fig. 62A

2003 CON 14 BG Env

MKAKGTQRNQHGLGKWLFLGLIICASNDLWVTYYGVPVWKEATTLFCASDAKAYDAEVHNWVATHACVPTDPNPQEVLENVTENF
 NMWENNMDQMOEDIIISLWDQSLKPCVELTPLCVTLNCTDENNTNNTNTRNDGEGEIKNCSEFNITTSLRDKIKKEYALFYRLDVVQMDND
 NSSYRLTSCNTSIIITQACPKVSTPIPIHYCAPAGFVILKCNKTFNGTGPCNTVSTVQCTHGIRPVVSTQLLNGSLAEIEEIVIRSKNFTD
 NAKTIIIVOLKDPINCTRPNNNTRKRITMGPRVLYTTGQIIGDIRKAHCNISKTWNNTLGQIVKKLREQFMNKTIVFQRSSGGDPPEIVM
 HSFNCRGEFFYCNTTQLFNSTWRSNSTWNTDITLPCRIKQIVNMWQKVGKAMYAPPISGQIRCSSNITGLLLIRDGGSNNTEF
 RPPGGNNMKDNWRSELYKYKVVKIEPLGVAPTRAKRRVQREKRAVGIGALLFGLGAAGSTMGAASMTLTVOARQLLSGIVQQNNLLRAIE
 AQQHMLQLTWGIKQLOARVLAVERYLKDQQLGIWGCSGKLICTTVPWNASWSNKSLLDIWNNMTWMEWEIEIDNYTGLIYTLIEQSNOQ
 QERNEQELLELDKWASLWNWFNITNLWYIKIFIMIIGGLIGLRIVFAVLSIINRVRKGYSPLSFQTLTHHQREPDPRPGRIEEEGEGQDKDR
 SIRLVSGFLALAWDDLRSLCLFSYHRLRDFILIAARTVELLGRSSLKGLRLGWEGLYLWNNLLLYWGRELKNAINLLDTVAIAVANWTDRA
 IEVVQRVGRAVLNIPVRIRQGLERALL\$

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Fig. 62B

2003 CON 14 BG Env.seq.opt

ATGAAGGCCAAGGACCCACGCAACTGGCAGTCCCTGTGGAAGTGGGGCACCCCTGATCCTGGGCCCTGGTGATCATCTGCTCCGCCCTCCAA
CGACCTGTGGGTGACCGTGTACTACGGCGTGGGAGGAGGCCACCAACCCCTGTCTGGCCCTCCGACGCCAAGGCCCTACGACG
CCGAGGTGCACACGTTGGGCCACCCACGCTGGTGGCCACCCACCCAGGAGGTGGCCCTGGAGAACGTGACCCGAGAACTTC
AACATGTGGAGAACAAACATGTTGACCCAGATGACAGGAGACATCATCTCCCTGTGGGACCACTGCTGAAGCCCTGCGTGGAGTGAACCC
CCTGTGCGTGACCCCTGAACCTGACCCGACTTCAACAAACACCAACCAACCCGCAACGAGGCGAGGCGAGATCAAGAAGT
GCTCCTTCAACATCAACACCTCCCTGGCGGACAAGATCAAGAAAGGAGTACGCCCTGTCTACAACCTGGACGTGGTGAGATGGACAACGAC
AATCCTCTTACCGCCTGACCTCTGCAACACCTCCATCATCAACCCAGGCCCTGCCCAAGGTGTCTTACCCCCATCCCATCTCACTAG
CGCCCGCGCGCTTCTGTGATCTCTGAAGTGCAACAAAGACCTTCAACGGCACCCGGCCCTGCAACCAAGTGTCCACCGTGCACTGCACCC
ACGGCATCCGCCCGCTTCTGTGATCTTCAAGTGCAACAAAGACCTTCAACGGCACCCGGCCCTGCGGAGGAGAGATCGTGTCCGCTCCAAGAACTTCACCGAC
AACGCCAAGACCATCATCGTGACGTGACGCTGAAGGACCCCATCGAGATCAACTGCAACCCGCCCCCAACAACAACCCGCAAGCGCATCAACATGGG
CCCCGGCCGCTGTATACACCAACCGGCCAGATCATCGGCGACATCCGCAAGGCCACTGCAACATCTCCAGGCCCTCCCGGGCGGACCCCGAGATCGTGATG
TGGGCCAGATCGTGAAGAAGTGGCGGAGTCTTCTACTGCAACACCAACCCAGCTGTCTGAACGGCTCCCTGCAACGGCACCCGGCCCTGCAACCAAGTGTCCACCG
CACTCCTTCAACTGCGGCGCGAGTCTTCTACTGCAACACCAACCCAGCTGTCTGAACCTCCAGCTCCCTGCAACGGCACCCGGCCCTGCAACCAAGTGTCCACCG
CACCAGACCAACAACACCGACCTGATCAACCTGCCCTGCCGATCAAGCAGATCGTGAACATGTGGCAGAGGTGGCAAGGCCATGTACG
CCCCCCCATCTCCGGCCAGATCCGCTGCTCCTCAACATCACCGGCTGTGATCCGCGACGGGCTCCAAACAACACCGGACCTTC
CGCCCGGGCGGCAACATGAAGGACAACTGGCGTCCGAGCTGTACAAGTACAAGTGTGAAGATCGAGCCCTCCAAACAACACCGGACCTTC
CGCGCCAGCGCGCTGGTGACGCGGAGAGCGCGCTGGGCATCGGCGCCCTGCTGTTCGGCTTCCTGGGCGCGCCGCTCCACCA
TGGGCGCGCCTCCATGACCTGACCGTGCAGGCGCCAGCTGCTGTCCGGCATCGTGACGACGAGAACCACTGCTGCGCGCATCGAG
GCCAGACGACATGCTGCAGTGAACCGTGTGGGCAATCAAGCAGTGCAGGCCCGCTGCTGGCGGTACCTGAAGGACCAAGCA
GCTGTGGGCATCTGGGGCTGCTCCGGCAAGTGTGACCAACCGTGCACCGCTCCCTGGTCCAAACAGTCCCTGGACGACA
TCTGGAAACAACATGACCTGGATGGAGTGGAGCGCGAGATCGACAACTACACGGCTGATCTACACCTGATCGAGCAGTCCCAAGAACCA
CAGGAGCGCAACGAGGAGTGTGGAGTGGACAAGTGGCCCTCCCTGTGGAACCTGGTCAACATCAACCACTGGCTGTGGTACATCAA
GATCTCATATGATCATCGGCGCTGATCGGCTGCGCATCGTGTCCCGTGTCTCATCATCAACCGCTGCGCAAGGCTACTCCC
CCCTGTCTTCCAGACCTGACCCACACAGCGGAGCCCGACCGCCCGCTGCGCTCCCTGTGCGCTGCGCATCAACCGCTGCGCAAGGCTACTCCC
TCCATCCGCTGGTGTCCGGCTTCTTGGCCCTGGGACGACCTGCGCTCCCTGTGCGCTGCGCATCAACCGCTGCGCAAGGCTACTCCC
CCTGATCGCGCCCGACCGTGGAGTGTGGGCGCTCCCTCCCTGAAGGCGCTGGCGCTGGGCTGGGCTGAAGTACCTGTGGAACC
TGCTGTGTACTGGGCGCGAGCTGAAGAACTCCGCCATCAACCTGTGGACACCGTGGCCATCGCCGTGGCCAACTGGACCGACCGCGCC
ATCGAGGTGGTGCAGCGCTGGGCGCGCTGTGAACATCCCCGTGGCATCCCGCCAGGGCCCTGGAGCGCGCCCTGTCTGTAA

Centralized HIV-1 gag/nef/pol Protein and the Codon-optimized Gene Sequences

Fig. 63A

1. 2003 CON S gag.PEP

MGARASVLSGGKLDWEKIRLRPGGKKKYRLKHLVNASRELERFALNPLGLLETSEGCQOIEQLQPALQTGSEELRSLYNTVATLYCVHQRI
 EVKDTKEALDKIEEENKSKQKTQAAADTGNSSKVSQNYPIVQNLQGMVHQAISPRTLNAWKVVEEKAFSPVPMFSALSEGATPQDL
 NTMLNTVGGHQAAMQMLKDTINEEAAEWDRLHPVHAGPIPPGQMRPRGSDIAGTTSTLQEQIGWMTSNPPIPVGEIYKRWIILGLNKIVRM
 YSPVSIIDIRQGPKEPFRDYVDRFFKTLRAEQATQDVKNWMTDTLLVQNPANPDCKTILKALPGATLEEMMTACQGVGPPSHKARVLAEAMS
 QVTNTTMMQRGNFKGQKRIIKCFNCGKEGHIARNCRAPRKKGCKGKEGHQMKDCTERQANFLGKIWPSNKGPRGNFLQSRPEPTAPPAE
 SFGFGEIITPSPKQEPKDKELYPLASLKSFLGNDPLSQ\$

Fig. 63B

2003 CON S gag.OPT

ATGGCGCCCGCGCTCCGTGCTGTCCGGCGGCAAGCTGGACGCTGGGAGAAGATCCGCTGGCCCCCGCGGCAAGAAGTACCGCCT
 GAAGCACTGTGTGGGCTCCCGGAGCTGGAGCGCTTCGCCCTGAACCCCGGCTGTGGAGACCTCCGAGGGTCCAGCAGATCATCG
 AGAGCTGCAGCCCGCTGCAGACCGGCTCCGAGGAGCTCGCTCCCTGTACAACACCGTGGCCACCTGTACTGCGTGCAACAGCGCATC
 GAGGTGAAGACACCAAGAGGCCCTGGACAAGATCGAGGAGGAGCAACAAGTCCAAGCAGAAGACCCAGCAGCGCCCGCCGACACCGG
 CAATCTCTCAAGTGTCCAGAACTACCCATCGTGCAAACTGTGAGGGCCAGATGGTGACAGGCCATCTCCCCCGCACCCCTGAACG
 CCTGGGTGAAGTGTGGAGGAGAGGCCCTTCTCCCCGAGGTGATCCCCATGTTCTCCGCTGTCCGAGGGCGCACCCCGCAGGACCTG
 AACACCATGTGAACACCGTGGGCGGCCACAGGCCGCGCATGCAGATGCTGAAGGACACCATCAACGAGGAGGCGCGCGAGTGGGACCGCT
 GCACCCGTGCACGCGGCCCATCCCCCGGCAGATGCGGAGCCCGGCTCCGACATCGCCGACCATCCACCTCCACCTCGCAGGAGC
 AGATCGGTGGATGACCTCAACCCCGCATCCCGTGGCGAGATCTACAAGCGCTGGATCATCTGGGCTGAACAAGATCGTGCGCATG
 TACTCCCCGTGTCCATCCTGGACATCCGCCAGGGCCCCAAGGAGCCCTTCGCGACTAGTGGACCGCTTCTTCAAGACCTGCGCGCCGA
 GCAGGCCACCCAGGACGTGAAGAACTGGATGACCGACACCTGTGTGTCAGAACGCCAACCCGACTGCAAGACCATCTGAAGGCCCTGG
 GCCCGGCGCCACCTGGAGGAGATGATGACCGCTGCCAGGCGTGGGCGGCTCCCAAGGCCCGCTGTGGCCGAGGCCATGTCC
 CAGGTGACCAACACACCATCATGATGACGCGGCAACTCAAGGGCCAGAAAGCGCATCATCAAGTGCTTCAACTGCGGCAAGGAGGCCA
 CATCGCCCGCAACTGCCGCGCCCCCGCAAGAAGGCTGTGGAAGTGGGCAAGGAGGCCACCCAGATGAAGGACTGCACCGAGCGCCAGG
 CCAACTTCCCTGGCAAGATCTGGCCCTCCAACAAGGGCGCCCCCGCAACTTCTGTGAGTCCCGCCCCGAGCCACCGCCCCCGCCGAG
 TCCTTCGGCTTCGGCGAGGAGATCACCCCTCCCCCAAGCAGGAGCCCCAAGGAGCTGTACCCCTGGCCCTCCCTGAAGTCCCTGTT
 CGGCAACGACCCCTGTCCAGTAA

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Fig. 64A

2. 2003_M.GROUP.anc gag.PEP

MGARASVLGGKLDWEKIRLRPGGKKYRLKHLVWASRELERFALNPGLLETAEGCQIMGOLPALQTGTEELRSLYNTVATLYCVHQRI
 EVKDTKEALDKIEEEQNKSQKQTQAAADKGDSSQVSONYPIVQNLQGMVHQAISPRTLNAWVKVVEEKAFSPVPIPMFSALSEGATPQDL
 NTMLNTVGGHQAAMQMLKDTINEEAAEWDRLHPVHAGPIPPGQMRPRGSDIAGTTSTLQEQIGWMTSNPPIPVGEIYKRWIILGLNKIVRM
 YSPVSIILDIRQPKPEPRDYVDRFFKTLRAEQATQDVKNWMTDTLLVQNPANPDKTILKALPGATLEEMMTACQGVGGPGHKARVLAEAMS
 QVTNANIMMQRGNFKPRRIRIVKCFNCGKEGHIARNCRAPRKKGCKGKEGHQMKDCTERQANFLGKIWPSNKGKPGNFLOSRPEPTAPPAAE
 SFGFGEIITPSPKQEPKDKELYPLASLKSIFGSDPLSQ\$

Fig. 64B

2003_M.GROUP.anc gag.OPT

ATGGCGCGCGCGCCTCCGTGCTGTCCGGCGGCAAGCTGGACGCCCTGGGAGAAGATCCGCCCTGGCGCGCGGGAAGAAAGTACCGCCT
 GAAGCACCTGGTGTGGCCTCCCGGAGCTGGAGCGCTTCCCTGAACCCGGCCTGCTGGAGACCGCGAGGCTGCCAGCAGATCATGG
 GCCAGCTGACGCCCTGACAGCCGACCGGACCGAGAGCTGCGTCCCTGTACAACACCGTGGCCACCCCTGTACTGCTGCACACGCGCATC
 GAGTGAAGGACACCAAGGAGGCCCTGGACACAGATCGAGGAGGAGCAAGTCCAGCAGAAGACCCAGCAGGCGCGCGCGGACACAAGG
 CGACTCCTCCAGGTGTCCAGAACTACCCATCGTGCAGAACCTGCAGGGCCAGATGTTGCCAGGCCATCTCCCCCGCACCCCTGAACG
 CCTGGGTGAAGTGGTGGAGGAGAGGCCCTTCTCCCCGAGGTGATCCCATGTTCTCCGCCCTGTCCGAGGGCGCCACCCCGCAGACCTG
 AACACCATGCTGAACACCGTGGGCGGCCACAGGCCGCCATGCAGATGCTGAAGGACACCATCAACGAGGAGGCGCGGAGTGGGACCGCCT
 GCACCCCGTGCACGCGCGCCCATCCCCCGGCGAGATGCGCGAGCCCCCGGCTCCGACATCGCCGCGCACCACTCCACCTGCAGGAGC
 AGATCGGCTGGATGACCTCCAAACCCCCCATCCCCGTGGCGGAGATCTACAAGCGCTGGATCATCTGGGCTGAACAAGATCGTGGCATG
 TACTCCCCCGTGTCCATCCTGGACATCCGCCAGGCCCCAAGAGCCCTTCCGCCACTACGTGGACCGCTTCTTCAAGACCTGCCGCCCGA
 GCAGGCCACCCAGGACGTGAAGAACTGGATGACCGACACCCCTGCTGGTGCAAGACCCCAACCCGACTGCAAGACCATCTGAAGCCCTGG
 GCGCGCGCCACCTGGAGGAGATGATGACCGCCTGCCAGGCGTGGGCGGCCCGGCCACAGGCCCGCTGTGGCGAGGCCATGTCC
 CAGGTGACCAACGCCAACATCATGATGCAGCGCGGCAACTTCAAGGGCCCCCGCGCATCGTGAAGTCTTCACTGCGGCAAGGAGGGCCA
 CATCGCCCGCAACTGCCGCGCCCCCGCAAGAGGCTGCTGGAAGTGGCGCAAGAGGCCACAGATGAAGACTGCACCGAGCGCCAGG
 CCAACTTCTGGGCAAGATCTGGCCCTCCAAACAGGCGCGCCCGCAACTTCTGCACTCCGCGCCGAGCCACCGCCCCCGCGCGAG
 TCCTTCGGCTTCGGCGGAGGATCACCCCTCCCCCAAGCAGGAGGCCCAAGGAGCTGTACCCCTGGCCTCCCTGAAGTCCCTGTT
 CGGCTCCGACCCCTGTCCCCAGTAA

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Fig. 65A

3. 2003 CON A1 gag.PEP

MGARASVLSGGKLDWEKIRLRPGGKKYRLKHLVWASRELERFALNPSSLLETTGGCQQIMEQLQPAKLTGTEELRSLYNTVATLYCVHQRI
 DVKDTKEALDKIEEIQNKSQKQTQQAADTGNSSKVSQNYPIVQNAQGMVHQSLSPRTLNAWKVIEEKAFSPVIMFSALESGATPQDL
 NMMLNIVGGHQAAQMLKDTINEEAAEWDRLHPVHAGPIPPGQMRPRGSDIAGTTSTPQEQIGWMTGNPPIPVGDIYKRWIILGLNKKIVRM
 YSPVSILDIKQGPKEPRDYVDRFFKTLRAEQATQEVKNWMTETLLVQANPDCKSILRALGPGATLEEMTACQGVGGPGHKARVLAEAMS
 QVQHTNIMMQRGNFRGQKRIKCFNCGKEGHLARNCRAPRKKGCKWKGKEGHQMKDCTERQANFLGKIWPSSKGRPGNFPQSRPEPTAPPAEI
 FGMGEEITSPPKQEQKDREQDPPPLVLSKSLFGNDPLSQ\$

Fig. 65B

3. 2003 CON A1 gag.OPT

ATGGGCGCCCGCCTCCGTGCTGTCCGGCGGCAAGCTGGACGCTGGAGAAAGATCCGCCCTGCGCCCCGGCGGCAAGAAGTACCGCCT
 GAAGCACCTGGTGTGGCCTCCCGAGCTGGAGCGCTTCGCCCTGAACCCCTCCCTGCTGGAGACCAACCGAGGGCTGCCAGCAGATCATGG
 AGCAGCTGCAGCCCGCCTGAAGACCGGACCGAGGAGCTGCGCTCCCTGTACAACACCGTGGCCACCTGTACTGCGTGCAACGCGCATC
 GACGTGAAGGACACCAAGGAGGCCCTGGACAAGATCGAGGAGATCCAGAACAAGTCCAAGCAGAAGACCCAGCAGGCCCGCCGACACCCGG
 CAATCCTCCAAGGTGCCAGAACTACCCCATCGTGCAAGACGCCAGGGCCAGATGGTGCAACCACTGTCCTGTCCCCCGCACCCCTGAACG
 CCTGGGTGAAGGTGATCGAGGAGAGGCTTCTCCCCGAGGTGATCCCATGTTCTCCGCCCTGTCCGAGGGCGCCACCCCGAGGACCTG
 AACATGATGCTGAACATCGTGGCGGCCACCAAGCGCCATGCAGATGCTGAAGACACCATCAACGAGGAGGCCCGCGAGTGGACCGCCT
 GCACCCCGTGACCGCGGCCCATCCCCCGGCCAGATCGCGAGCCCGCGGCTCCGACATCGCCGCAACCACTCCACCCCGCAGGAGC
 AGATCGGCTGGATGACCGGCAACCCCATCCCCGTGGCGACATCTACAAGCGCTGGATCATCTGGGCTGAACAAGATCGTGCGCATG
 TACTCCCCGTGTCCATCCTGGACATCAAGCAGGGCCCCAAGGAGCCCTTCCGCGACTACGTGGACCGCTTCTTCAAGACCCCTGCGGCCGA
 GCAGGCCACCCAGGAGTGAAGAACTGGATGACCGAGACCCCTGCTGGTGCAAGACGCCAACCCCGACTGCAAGTCCATCTGCGGCCCTGG
 GCCCCGCGCCACCCCTGGAGGAGATGATGACCGCTGCCAGGGCTGGGCGGCCCAAGGCCCGCGTGTGCTGCGCGCCATGTCC
 CAGGTGCAGCACACCAACATCATGATGACGCGGCAACTTCCGCGGCCAGAAGCGCATCAAGTGTCTCACTGCGGCAAGGAGGCCACCT
 GGGCCGCAACTGCCCGCCCCCGCAAGAGGCTGCTGGAAGTGGGCAAGGAGGCCACCAAGATGAAGACTGCACCGAGCGCCAGGCCA
 ACTTCTGGGCAAGATCTGGCCCTCTCTCAAGGGCGCCCCGGCAACTTCCCCAGTCCCCCGCCGAGCCACCGCCCCCGCCGAGATC
 TTCGGCATGGCGGAGGAGATCACTCCCCCCCCCAAGCAGGAGCAGAAGGACCCGCGAGGACCCCCCTGGTGTCCCTGAAGTCCCTGTT
 CGGCAACGACCCCTGTCCAGTAA

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Fig. 65C

4. 2003 A1.anc gag. PEP

MGARASVLGGKLD AWEKIRLRPGGKKYRLKHLVWASRELERFALNPGLLETAEGCQIQINGQLQPALKTGTEELRSLYNTVATLYCVHQRI
 EVKDTKEALDKIEEI QNKSQKTQQAADTGNSSKVSQNYPIVQNAQGMVHQSLSPRTLNAWKVIEEKAFSPVIEPMFSALSEGATPQDL
 NMMLNIVGGHQAAMQMLKDTINEEAAEWDRLHPVHAGPIPPGQMPREPRGSDIAGTTSTLQEQIGWMTGNPPIPVGDIYKRWIILGLNKIVRM
 YSPVSILDIRQGPKEPFRDYVDRFFKTLRAEQATQEVKNWMTETLLVQANANPDCKSILRALGPGATLEEMMTACQGVGGPGHKARVLAEAMS
 QVQNTDIMMQRGNFRGPKRIKCFNCGKEGHLARNCRAPRKKGWKCKEGHQMKDCTERQANFLGKIWPSSKGRPGNFPQSRPEPTAPPAEN
 FGMGEEMISSPKQEQKDREQYPPVLVSLKSLFGNDPLSQ\$

Fig. 65D

2003 A1.anc gag.OPT

ATGGGCGCCCGCCCTCCGTGCTGTCCGGCGGCAAGCTGGACGCCCTGGGAGAAGATCCGCCCTGCGCCCCCGGGGCAAGAAGTACCGCCT
 GAAGCACCTGGTGTGGCCCTCCCGAGCTGGAGCGCTTCGCCCTGAACCCCGGCTGCTGGAGACCCGCGAGGCTGCCAGCAGATCATGG
 GCCAGCTGACGCCGCCCTGAAGACCGGCAACGAGGAGCTGCGCTCCCTGTACAACACCGTGGCCACCTGTACTGCGTGCAACGAGGCATC
 GAGGTGAAGGACACCAAGGAGGCCCTGGACAAGATCGAGGAGATCCAGAACAAGTCCAAGCAGAGACCCAGCAGGCCCGCCGACACCCGG
 CAACTCCTCCAAGGTGTCCAGAACTACCCCATCGTGCAAGACGCCAGGCCAGATGGTGCACCATCCTGTCCCCCGCACCTTGAACG
 CCTGGTGAAGGTGATCGAGGAGAAGCCCTTCTCCCCGAGGTGATCCCCATGTTCTCCGCCCTGTCCGAGGGCGCACCCCGCAGGACCTG
 AACATGATGCTGAACATCGTGGCGGGCCACCAAGGCCCATGTCAGATGCTGAAGACACCATCAACGAGGAGCGCCGAGTGGGACCGCCT
 GCACCCCGTGCAAGCGGCCCATCCCCCGGCGAGATGCGCGAGCCCGCGGCTCCGACATCGCCGCAACCACTCCACCTGCAGGAGC
 AGATCGGCTGGATGACCGGCAACCCCGCATCCCGGTGGCGACATCTACAAGCGTGGATCATCTGGGCTGAACAAGATCGTGGCGATG
 TACTCCCCGTGTCCATCCTGGACATCCGCCAGGGCCCAAGGAGCCCTTCCGCGACTACGTGGACCCGCTTCTTCAAGACCTGCGCGCCGA
 GCAGGCCACCCAGGAGGTGAAGAACTGGATGACCGAGACCTGCTGGTGCAGAACGCCAACCCGACTGCAAGTCCATCCTGCGCGCCCTGG
 GCCCGCGCCACCTGGAGGAGATGATGACCGCCTGCCAGGGCGTGGCGGCCCAAGCGCATCAAGTGTCTCACTGCGGCAAGGAGGCCACCT
 CAGGTGCAGAACACCGACATCATGATGACGCGGCAACTTCCGCGGCCCAAGCGCATCAAGTGTCTCACTGCGGCAAGGAGGCCACCT
 GGCCCGCAACTGCCGCGCCCGCAAGAGGGCTGCTGGAAGTGGGCAAGGAGGCCACCCAGATGAAGGACTGCACCGAGCGCCAGGCCA
 ACTTCTCGGCAAGATCTGGCCCTCTCTCAAGGGCGGCCCGGCAACTTCCCCCAGTCCCCCGCCGAGCCACCGCCCCCGCGAGAAC
 TTCGGCATGGCGGAGGAGATGATCTCTCTCCCCAAGCAGGAGCAGAGGACCCGCGAGCAGTACCCCCCTGSGTGCTCCCTGAAGTCCCTGTT
 CGGCAACGACCCCTGTCCCAAGTAA

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Fig. 66A

5. 2003 CON A2 gag .PEP

MGARASILSGGKLDWEKIRLRPGGKKYRLKHLVWASRELEKFSINPSLLETSEGCROIIRQLQPALQTGTEELKSLYNTVAVLYCVHQRI
 DVKDTKEALDKIEEQNKCKQKTQHAAADTGNSSSSQNYPIVQNAQGMVHQAI SPRTLNAWKVVEEKAFSPEVIPMTALSEGATPQDL
 NTMLNTVGGHOAMQMLKDTINEEAAEWDRLLHPVHAGPIPPGQMREPRGSDIAGTSTLQEQIGWMTSNPPIPVGEIYKRWIILGLNKIVRM
 YSPVSILDIRQPKPEFRDYVDRFFKTLRAEQATQEVKNWMTDTLLIVQANPDKSILRALGPGATLEEMMTACQGVGGPSPSHKARVLAEMS
 QVQNTNTNIMQNGNFRGQKRIKFCNCGKEGHLARNCRAPRKKGCKGKEGHQMKDCTERQANFLGKIWPSNKGPRGNFPQSRTEPTAPPA
 ENLRMGEEITSSLKQELKTREYPNPAISLKSIFGNDPLSQ\$

Fig. 66B

2003 CON A2 gag .OPT

ATGGGCGCCGCGCCTCCATCCTGTCCGGGGGCAAGCTGGACGCCCTGGGAGAAGATCCGCCCTGCGCCCGGGGCAAGAAAGTACCGCCT
 GAAGCACCTGGTGTGGCCTCCCGGAGCTGGAGAAGTTCTCCATCAACCCCTCCCTGCTGGAGACCTCCGAGGCTGCCGCCAGATCATCC
 GCCAGCTGACGCCGCCCTGACACCGGACCGGAGAGCTGAAGTCCCTGTACAACACCCGTGGCCGTGTACTGCGTGCAACGCGCATC
 GACGTGAAGGACACCAAGAGGCCCTGGACAAGATCGAGGAGGAGCAGAACAAAGTGCAAGCAGAAAGACCCAGCACGCCGCCGACACCCGG
 CAATCCTCCTCCTCCAGAACTACCCCATCGTGCAGAACGCCAGGCCAGATGGTGACCAAGGCATCTCCCCCGCACCCCTGAACG
 CCTGGGTGAAGTGGTGGAGGAGAAGCCTTCTCCCCGAGGTGATCCCCATGTTACCGCCCTGTCCGAGGGCGCCACCCCCAGGACCTG
 AACACCATGCTGAACACCGTGGCGGCCACAGGCCGCCATGCAGATGCTGAAGGACACCATCAACGAGGAGGCCGCCGAGTGGGACCGCCT
 GCACCCCGTGCAACGCCGCCCATCCCCCGGCCAGATGCGCGAGCCCCCGGCTCCGACATCGCCGACACCATCCACCCCTGCAGGAGC
 AGATCGGCTGGATGACCTCCAAACCCCCCATCCCCGTTGGCGGAGATCTACAAGCGCTGGATCATCTGGGCTGAACAAGATCGTGCGCATG
 TACTCCCCCGTGTCCATCTTGACATCCGCCAGGGCCCCAAGAGCCCTTCCGCGACTACGTGGACCGCTTCTTCAAGACCCCTGCGCGCCGA
 GCAGGCCACCCAGAGGTGAAGAACTGGATGACCGACACCCCTGCTGGTGACAGAACGCCAACCCGACTGCAAGTCCATCCTGCGCGCCCTGG
 GCCCGGCGCCACCTGGAGGAGATGATGACCGCTGCCAGGGCGTGGCGGCCCTCCCAACAAGCCCGCGTGTGGCCGAGGCCATGTCC
 CAGGTGCAGAACACCAACATCATGATGCAGCGCGCAACTTCCGCGGCCAGAACCGCATCAAGTCTTCAACTGCGGCAAGGAGGG
 CCACCTGGCCCGCAACTGCCGCGCCCCCGCAAGAGGGTGTCTGGAAGTGCGGCAAGAGGGCCACCATGAGGACTGACCCGAGCGCC
 AGGCCAACTTCTTGGCAAGATCTGGCCCTCCAAACAAGGGCCCCCGCAACTTCCCCCAGTCCCCGACCGAGCCACCGCCCCCGCC
 GAGAACCTGCGCATGGGCGGAGGAGATCACCTCCTCCCTGAAGCAGGAGCTGAAGACCCCGGAGCCCTACACCCCGCCATCTCCCTGAAGTC
 CCTGTTGGCAACGACCCCTGTCCCAGTAA

Fig. 67A

6. 2003 CON B gag. PEP

MGARASVLSGGELDRWEKIRLRPGGKKKYLKHIVWASRELERFAVNPGLLETSEGRQILQLQPSLOTGSEELRSLYNTVATLYCVHQRI
 EVKDTKEALEKIEEEQNKSKKKAQQAADTGNSSQVSNYPVQNLQGMVHQAI SPRTLNAWVKVVEKAFSPVIMFSALEGATPQDL
 NTMLNTVGQHQAAMQMLKETINEEAAEWDRLHPVHAGPIAPGQMRPRGSDIAGTTSTLQEQIGWMTNNPPIPVGEIYKRWIILGLNKIVRM
 YSPTSILDIRQGPKEPFRDYVDRFYKTLRAEQASQEVKNWMTETLLVQNPANPDCKTILKALGPAATLEEMMTACQGVGGPGHKARVLAEAMS
 QVTNSATIMMQRGNFRNRQKTVKCFNCGKEGHI AKNCRAPRKKGCWKCKGKEGHQMKDCTERQANFLGKIWPSHKGRPGNFLOSRPEPTAPPE
 ESFRFGEETTPSQKQEPIDKELYPLAS

Fig. 67B

2003 CON B gag. OPT

ATGGGCGC¹⁰⁸CGGCTCCGTGTCCGGGGGGGAGCTGGACCGCTGGAGAG¹⁷⁸AGATCCGCTGCGCCCGCGGCAAGAGTACAAAGCT
 GAAGCACATCGTGTGGGCTCCCGGAGCTGGAGCGCTTCGCCGTGAACCCCGGCTGTGGAGACCTCCGAGGGCTGCCGCGAGATCCTTGG
 GCCAGCTGCAGCCCTCCCTGCAGACCGGCTCCGAGGAGCTCCGCTCCCTGTACAACACCGGTGGCCACCTGTACTGCGTGCAACGCGCATC
 GAGGTGAAGGACACCAAGGAGGCCCTGGAGAAGATCGAGGAGGAGCAGAAACAGTCCAAGAAGAGGCCAGCAGGCCGCGCGGACACCGG
 CAACTCCTCCAGGTGTCAGAACTACCCCATCGTGCAAGACCTGCAGGGCCAGATGGTGACCAAGGCCATCTCCCCCGCACCCCTGAACG
 CCTGGGTGAAGGTGGTGAGGAGAAGGCCCTTCTCCCGAGGTGATCCCATGTCTCCGCGCTGTCCGAGGGCGGCCACCCCGAGGACCTG
 AACACCATGCTGAACACCGTGGCGGCCACCGGCCCATGCAGATGCTGAAGGAGACCATCAACGAGGAGCGCGCGAGTGGACCGCCT
 GCACCCCGTGACCGCGGCCCATCGCCCGGCGAGATGCGGAGCCCCCGGCTCCGACATCGCCGGACCATCTCCACCTGCAGGAGC
 AGATCGGCTGGATGACCAACACCCCGGCGAGATCTACAAGCGCTGGATCATCTTGGGCTGAACAAGATCGTGCGCATG
 TACTCCCCACCTCCATCCTGGACATCCGCCAGGGCCCCAAGGAGCCCTTCCGCGACTACGTGGACCGCTTCTACAAGACCTGCGCGCCGA
 GCAGGCTCCAGGAGGTGAAGAACTGGATGACCGAGACCTGTGTGTGAGAACGCCAACCCCGACTGCAAGACCATCTGAAGGCCCTGG
 GCCCGCGCCACCTTGAGGAGATGATGACCGCTGCCAGGGCTGGCGGCGGCCCGCCACAGGCCCGTGTGGCCGAGGCCATGTCC
 CAGGTGACCAACTCCGCCACCATCATGATGCAGCGCGGCAACTTCCGCCAACAGCGCAAGACCGTGAAGTCTTCAACTGCGGCAAGGAGGG
 CCACATCGCCAAAGAACTGCCGCGCCCGCCGCAAGAGGGCTGCTGGAAGTGGGGCAAGGAGGCCACCATGAAAGGACTGCACCGAGCGCC
 AGGCCAACTTCTTGGGCAAGATCTGGCCCTCCACAGGGCGCCCGCGCAACTTCTGCAAGTCCCGCCCGAGCCCAACCGCCCCCGGAG
 GAGTCTTCCGCTTCCGGCGAGGAGACCAACACCCCTCCAGAAAGCAGGAGCCCATCGACAAGGAGCTGTACCCCTGGCCTCCTAA

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Fig. 67C

7. 2003 B. anc gag. PEP

MGARASVLSGGKLDKWEKIRLRPGGKKYKLIKHIWASRELERFAVNPGLLETSEGRQIILGQLOPALQGTSEELRSLYNTVATLYCVHQRI
 EVKDTKEALDKIEEQNKSKKAQQAADTGNSSQVSQNYPIVQNLQGMVHQAI SPRTINAWVKVVEKA FSPVIMFSAISEGATPQDL
 NTMLNTVGHHQAAMQMLKETINEEAAEWDRLHPVHAGPIAPGQMRPRGSDIAGTTSTLQEQIGWMTNNPPIPVGEIYKRWIILGLNKIVRM
 YSPISILDIRQPKPEFRDYVDRFYKTLRAEQASQDVKNWMTETLLVQNPANPDCKTILKALGPAATLEEMMTACQGVGGPGHKARVLAEAMS
 QVTNSTTIMMQRGNFRDQKIVKCFNCGKEGHIARNCRAPRKKGCWKCKEGHQMCKDCTERQANFLKIWP SHKGRPGNFLQSRPEPTAPPE
 ESFRFGEETTPSQKQEPIDKELYPLASLKSLEGNDPSSQS

Fig. 67D

2003 B. anc gag. OPT

ATGGCGCGCGCGCTCCGTGCTGTCCGGCGGCAAGCTGGACAAGTGGGAGAAGATCCGCCTGCGCCCCGGCGGAAGAAGTACAAGCT
 GAAGCACATCGTGTGGGCTCCCGGAGCTGGAGCGCTTCGCCGTGAACCCCGGCTGTGGAGACCTCCGAGGGCTGCCGCCAGATCCTGG
 GCCAGCTGACGCCCGCTGCAGACCGGCTCCGAGGAGCTGGCTCCCTGTACAACACCGTGGCCACCTGTACTGCGTGACACGCGCATC
 GAGGTGAAGGACACCAAGGAGGCGCTGGACAAGATCGAGGAGGAGCAGAACAAAGTCCAAGAAGAAGGCCAGCAGGGCGCGCCGACACCGG
 CAACTCCTCCAGGTGTCCAGAACTACCCCATCGTGCAGAACCTGCAGGGCCAGATGGTGACAGGCCATCTCCCCCGCACCCCTGAACG
 CCTGGGTGAAGGTGTGGAGGAGAAGGCTTCTCCCCGAGGTGATCCCATGTCTCCGCCCTGTCCGAGGGCGCACCCCGCAGGACCTG
 AACACCATGCTGAACACCGTGGCGGCCACCAAGCGCCATGCAGATGCTGAAGGAGACCATCAACGAGGAGGCCCGGAGTGGACCGCCT
 GCACCCCGTGCACCGCGGCCCATCGCCCCCGGCCAGATCGCGGAGCCCCCGGCTCCGACATCGCCGGCACCACTCCACCTGCAGGAGC
 AGATCGGCTGGATGACCAACAACCCCCCATCCCCGTGGCGGAGATCTACAAGCGCTGGATCATCCTGGGCTGAACAAGATCGTGGCGCATG
 TACTCCCCCATCTCCATCCTGGACATCCGCCAGGGCCCCAAGGAGCCCTTCCGCGACTACGTGGACCGCTTCTACAAGACCTGCCGCGCGA
 GCAGGCTCCAGGACGTGAAGAACTGGATGACCGAGACCTGTGCTGGTGCAAGACGCCAACCCCGACTCAAGACCATCTCTGAAGGCCCTGG
 GCCCCCGCCACCTGGAGGAGATGATGACCGCTGCCAGGGCGTGGCGGCCCCCGGCCACAAGGCCCGCTGTGCTGGCCAGGCCATGTCC
 CAGTGACCAACTCCACCATCATGATGCAGCGCGCAACTTCCGCGACCGCAAGATCGTGAAGTCTTCAACTGCGGCAAGGAGGG
 CCACATCGCCCGCAACTGCCCGCCCCCGCAAGAGGGCTGTGGAAGTGGCGCAAGGAGGCCACCAAGATGAAGGACTGACCGGAGCGCC
 AGGCCAACTTCTTGGCAAGATCTGGCCCTCCCAAGGGCGCCCCGCAACTTCTGTGAGTCCCGCCCCGAGCCACCGCCCCCGGAG
 GAGTCTTCCGCTTCGGCGAGGAGACCAACCCCTCCAGAGCAGGAGCCCATCGACAAGGAGCTGTACCCCTGGCCTCCCTGAAGTC
 CCTGTTCCGCAACGACCCCTCCTCCAGTAA

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Fig. 68A

8. 2003 CON C gag. PEP
 MGARASILRGGLDKWEKIRLRPGGKKHYMLKHLVWASRELERFALNPGLLETSEGCKQIIKQLPALQOTGTEELRSLYNTVATLYCVHEKI
 EVRDTKEALDKIEEEQNKSOQKTQAKAADGKVSQNYPIVQNLQGMVHQAIISPTLNAWKVIEEKAFSPVIMFTALSEGATPQDLNTM
 LNTVGGHQAAQMMLKDTINEEAAEWDRLHPVHAGPIAPGQMRPRGSDIAGTTSTLQEQIAWMTSNPPIPVGDIYKRWIILGLNKIVRMYS
 VSILDIKQGPKEPFRDYDRFFKTLRAEQATQDVKNWMTDILLVQANPDCKTILRALPGATLEEMTACQGVGGPSHKARVLAEAMSQAN
 NTNIMQSRNFKGPKRIVKFCNCGKEGHIARNCRAPRKKGCWKCKGEGHMKDCTERQANFLGKIWPESHKGRPNFLQNRPEPTAPAESFR
 FEETTPAPKQEPKDRPLETSLKSLFGSDPLSQS

Fig. 68B

2003 CON C gag. OPT
 ATGGCGCGCGGCTCCATCTGCGCGGGCAAGCTGGACAAGTGGGAGAAGATCCGCCCTGCGCCCCGCGGCAAGAAAGCACTACATGCT
 GAAGCACCTGGTGGGCTCCCGGAGCTGGAGCGCTTCGCCCTGAACCCGGCTGTGGAGACCTCCGAGGGCTGCAAGCAGATCATCA
 AGCAGCTGACGCCCGCTGCAGACCGGCACCGAGGAGCTGCGCTCCCTGTACAACACCGTGGCCACCTGTACTGCGTGCAAGAGATC
 GAGTGGCGGACACCAAGAGGCCCTGGACAAGATCGAGGAGGAGCAGACAAGTCCAGCAGAAAGCCAGAGGCCAAGGCCCGCCGACGG
 CAAGGTGCCAGAACTACCCCATCGTGCAGAACCTGCAGGGCCAGATGGTGACACAGGCCATCTCCCCCGACCTGAACGCTGGGTGA
 AGTGATCGAGGAGAAGCCTTCTCCCCGAGGTGATCCCCATGTTACCGCCCTGTCCGAGGGCGCCACCCCGAGGACCTGAACACCATG
 CTGAACACCGTGGCGGCCACAGGCCCGCATGCAGATGCTGAAGGACACCATCAACGAGGAGGCCCGCGAGTGGGACCCGCTGACCCCGT
 GCACGCGGCCCATCGCCCCCGGCGAGATCGCGGAGCCCGGCTCCGACATCGCGGACACCATCCACCTGCAGGAGCAGATCGCCT
 GGATGACCTCCAAACCCCATCCCCGTGGCGGACATCTACAAGCGCTGGATCATCTCTGGGCTGAACAAGATCGTGCGCATGTACTCCCC
 GTGTCCATCTTGACATCAAGAGGCCCCAAGAGCCCTTCCGCGACTACGTGGACCGCTTCTTCAAGACCTCGCGGCCCTGGGCCCGGCG
 CCAGGACGTGAAGAACTGGATGACCGACACCTTGTGGTGAGAACCCCAACCCGACTGCAAGACCATCTGCGCGCCCTGGGCCCGGCG
 CCACCTGGAGGAGATGATACCGCTGCGAGGGCGTGGCGGCCCTCCCAACAAGGCCCGGTGCTGGCCGAGGCCATGTCCAGGCCAAC
 AACACCAACATCATGATGACGCGTCCAACTCAAGGCCCCCAAGCGCATCGTGAACTGCTCAACTGCGCAAGGAGGCCACATCGCCCG
 CAACTGCCGCGCCCCCGCAAGAAAGGCTGCTGGAAGTGGGCAAGGAGGCCACACAGATGAAGGACTGACCGAGGCCAGGCCAACTCC
 TGGGCAAGATCTGGCCCTCCCAACAAGGGCCGCTCCGGCAACTTCTGTGAGAACCGCCCCGAGCCACCGCCCCCGCGAGTCCCTCCGC
 TTCGAGGAGACCAACCCCGCCCCCAAGCAGGAGCCCCAAGGACCGCGAGCCCTGACCTCCCTGAAGTCCCTGTTCCGCTCCGACCCCCCTGTC
 CCAGTAA

Fig. 68C

9. 2003 C.anc. gag. pep

MGARASILRGKLDITWEKIRLRPGGKHHYMIKHLVWASRELERFALNPGLLSETSEGCKQIMKQLPALQTGTEELRSLYNTVATLYCVHERI
 EVRDTKEALDKIEEEQNSQOKTQQAEEAADGNGKVSQNYPIVQNLQGMVHQAI SPRTLNAWVKVVEEKA FSPV I PMFTAL SEGATPQDL
 NTMLNTVGHHQAAMQMLKDTINEEAAEWDRLHPVHAGPVAPGQMREPRGSDIAGTSTLQEQIAWMTSNPPIPVGDIYKRWIILGLNKIVRM
 YSPVSILDIKQGPKEPFRDYVDRFFKTLRAEQATQDVKNWMTDTLLVQANANPDCKTILRALPGATLEEMMTACQGVGGPGHKARVLAEAMS
 QANNTNIMMORSNFKPKRIVKCFNCGKEGHIARNCRAPRKKGWCKGKEGHQMKDCTERQANFLGKIWP SHKGRPGNFLQSRPEPTAPPAE
 SRFEEETTPAPKQEPKDRPLETSLKSLFGSDPLSQ\$

Fig. 68D

2003 C.anc. gag. OPT

ATGGGCGCCGCGCTCCATCTGCGCGGGCAAGCTGGACACCTGGGAGAAGATCCGCTGCGCCCCGGGGCAAGACACTACATGAT
 CAAGCACCTGGTGTGGGCTCCCGGAGCTGGAGCGCTTCGCCCTGAACCCCGGCTGCTGGAGACCTCCGAGGGCTGCAAGCAGATCATGA
 AGCAGCTGCAGCCCGCTGCAGACCGGACCGAGGAGCTGCGCTCCCTGTACAACACCGTGCGCCACCTGTACTGCGTGCAAGCGCATC
 GAGGTGCGGACACCAAGGAGGCCCTGGACAAGATCGAGGAGGAGCAGAACAGTCCAGCAGAAGACCCAGCAGGCCGAGGCCGCGGACGG
 CGACAACGGCAAGGTGTCCAGAACTACCCCATCGTGCAAGAACCTGCAGGCCAGATGGTGACCAAGGCCATCTCCCCCGCACCCCTGAACG
 CCTGGGTGAAGGTGGTGAGGAGAAGGCCCTTCTCCCCGAGGTGATCCCCATGTTCAACCGCTGTCGAGGGCGCCACCCCGCAGGACCTG
 AACACCATGCTGAACACCGTGGCGGCCACCAAGCCGCGCATGCAGATGCTGAAGGACACCATCAACGAGGAGGCCGCGGAGTGGGACCGCT
 GCACCCCGTGACCGCGGCCCGGTGGCCCCCGGCGAGATGCGGAGCCCCCGGCTCCGACATCGCCGACCATCCACCTGCAAGATCGTGCGGAGC
 AGATCGCCTGGATGACCTCCAAACCCCGCATCCCGTGGCGACATCTACAAGCGCTGGATCATCTGGGCTGAACAAGATCGTGCGCATG
 TACTCCCCGTGTCCATCTGGACATCAAGCAGGGCCCCAAGAGCCCTTCCGCGACTACGTGGACCGCTTCTTCAAGACCTGCGCGCCGA
 GCAGGCCACCCAGGACGTGAAGAACTGGATGACCGACACCTGCTGGTGCAAGACGCCAACCCCGACTGCAAGACCATCCTGCGCGCCCTGG
 GCCCGGCGCCACCTGGAGGAGATGATGACCGCTGCCAGGGCGTGGCGGGCCCCCGGCCACAAGGCCCGCTGCTGGCCGAGGCCATGTCC
 CAGGCCAACACCAACATCATGATGCAGCGCTCCAACTCAAGGGCCCCAAGCGCATCGTGAAGTGTCAACTGCGGCAAGGAGGCCA
 CATCGCCCGCAACTGCCGCGCCCCCGCAAGAGGCTGCTGAAGTGGCGCAAGGAGGCCACCAAGATGAAGACTGCAACCGAGCGCCAGG
 CCAACTTCCTGGCAAGATCTGGCCCTCCCAAGGGCGCCCCGCAACTTCTGTGAGTCCCGCCCCGAGCCACCGCCCCCGCCGAG
 TCCTTCCGCTTCGAGGAGACCAACCCCGCCCCCAAGCAGGAGCCCGAGGCCCTGACCTCCCTGAAGTCCCTGTTCGGCTCCGA
 CCCCCGTGTCCTCAGTAA

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Fig. 69A

10. 2003 CON D gag. PEP

MGARASVL^{SG}KKLDAWEKIRLPGGKKYRLKHIVWASRELERFALNPGLLTSETSEGCKQIIGQLQPAIQTSGEELRSLYNTVATLYCVHERI
 EVKDTKEALEKIEEEQNKS^{KK}KAQQAADTGNSSQVSONYPIVQNLQGMVHQAI^{SP}RTILNAWKVIEEKA^{FS}PEVIPMFSALSEGATPQDL
 NTMLNTVG^{GH}QAAMQMLKETINEEAEWDR^{LHP}VHAGPVAPGQMRPRGSDIAGTTSTLQEQIGWMTSNPPIPVGEIYKRWIILGLNKIVRM
 YSPVSILDIRQPKPEFRDYVDRFYKTLRAEQASQDVKNWMTETLLVQANPDCKTILKALGPEATLEEMTACQGVGGPSHKARVLA^{EAMS}
 QATNSAAVMQ^{RGN}E^{FK}PRKI^{IK}CNFCGKEGHI^{AK}NCRAPRKKGCKGKEGHQMKDCTERQANFLGKIWP^{SH}KGRPGN^{FL}QSRPEPTAPPA
 ESFGGEIITPSQKEQKDKELYPLTSLKSLFGNDPLSQ\$

Fig. 69B

2003 CON D gag. OPT

ATGGGCGCCGCGCTCCGTGCTGTCCGGCGGAAGCTGGACGCCCTGGAGAAGATCCGCCCTGCGCCCCGGCGGCAAGAAGTACCGCCT
 GAAGCACATCGTGTGGCCTCCCGGAGCTGGAGCGCTTCGCCCTGAACCCCGGCTGTGGAGACCTCGGAGGCTGCAAGCAGATCATCG
 GCCAGCTGCAGCCCGCCATCCAGACCGCTCCGAGGAGCTGCGCTCCCTGTACAACACCGTGGCCACCTGTACTGCGTGCACGAGGCATC
 GAGGTGAAGACACCAAGAGGCCCTGGAGAAGATCGAGGAGGAGCAGAACAAAGTCCAAAGAGGCCAGCAGGCCCGCCGACACCGG
 CAACTCTCCAGGTGTCCAGAACTACCCCATCTGCAGAACCTGCAGGCCAGATGGTGCACAGGCCATCTCCCCCGCACCTGAACG
 CCTGGGTGAAGTGATCGAGGAGAAGCCCTTCTCCCCGAGTGATCCCCATGTTCTCCGCTGTCCGAGGGCGCCACCCCCAGGACCTG
 AACACCATGCTGAACACCGTGGCGGCCACCAAGCGCCCATGCAGATGCTGAAGGAGACCATCAACGAGGAGGCCCGCGAGTGGGACCGCCT
 GCACCCGTGCACCGCGCCCTGTGGCCCCCGGCGAGATGCGGAGCCCCGCGCTCCGACATCGCCGACCCACCTCCACCTGCAGGAGC
 AGATCGGTGGATGACCTCAACCCCCCATCCCCGTGGCGGAGATCTACAAGCGCTGGATCATCTGGGCTGAACAAGATCGTGGCGCATG
 TACTCCCCGTGTCCATCTGGACATCCGCCAGGGCCCCAAGAGCCCTTCCGGACTACGTGGACCGCTTCTACAAGACCTTGGCGCCGA
 GCAGGCTCCCAAGGACGTGAAGACTGGATGACCGGCTGCCAGGCGTGGCGGCCCTCCCAAGGCCCGCTGCTGGCCGAGGCCATGTCC
 GCCCGAGGCCACCTGGAGGAGATGATGACCGCTGCCAGGCGTGGCGGCCCTCCCAAGGCCCGCTGCTGGCCGAGGCCATGTCC
 CAGGCCACCAACTCCGCGCCGTGATGATGAGCGCGCAACTCAAGGGCCCCCGCAAGATCATCAAGTGTCTCAACTGCGGCAAGGAGGG
 CCACATCGCCAAGAACTGCCGCGCCCCCGCAAGAGGCTGTGGAAGTGGCGCAAGGAGGCCACCAAGATGAAGGACTGCACCGAGCGCC
 AGGCCAACTTCTGGCAAGATCTGGCCCTCCCAAGGGCGCCCGGCAACTTCTGTGAGTCCCGCCCGAGCCACCGCCCCCCCCGCC
 GAGTCTTCCGCTTCGGCGAGGAGATCACCCCTCCCAAGAGGAGCAGAAGGAGCTGTACCCCTGACCTCCCTGAAGTCCCT
 GTTCGGCAACGACCCCTGTCCAGTAA

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Fig. 70A

11. 2003_CON_F_gag.PEP

MGARASVLGGKLDWEKIRLRPGGKKYRMKHLVWASRELERFALDPGLLETSEGCQKIIGQLQPSLQTSSEELRSLYNTVAVLVCVHQKV
 EVKDTKEALEKLEEQNKSQKTQAAADKGVSONYPIVQNLOGQMVHQAISPRTLNANVKVIEKAFSPVIMFSALESEGATPDQDLNTML
 NTVGGHQAAMQMLKDTINEEAEDWRLHPVHAGPIPPGQMRPRGSDIAGTTSTLQEQIQWMTSNPPVPVGDIIYKRWIILGLNKIVRMYSVP
 SILDIRQGPKEPRDYVDRFFKTLRAEQATQEVKGWMTDTLLVQANPDCIKLALPGPGLLEEMMTACQGVGGPGHKARVLAEAMSQATN
 TAIMMQSNFKGORRIIVKFCNCGKEGHIAKNCRAPRKKGWKCGRGHEGHQMKDCTERQANFLGKIWPSNKGPRGNFLQSRPEPTAPPAESFGF
 REEITSPKQEQKDEGLYPPLASLSLFGNDP\$

Fig. 70B

2003_CON_F_gag.OPT

ATGGGCGCCCGCGCCTCCGTGCTGTCCGGCGGCAAGCTGGACGCCCTGGGAGAAGATCCGCCCTGCGCCCCCGCGGCAAGAAGTACCGCAT
 GAAGCACCTGGTGTGGCCTCCCGGAGCTGGAGCGCTTCGCCCTGGACCCCGCCTGCTGGAGACCTCCGAGGGCTGCCAGAAGATCATCG
 GCCAGCTGCAGCCCTCCCTGCAGACCGGCTCCGAGGAGTGGCTCCCTGTACAAACACCGTGGCCGTGCTGTACTGCGTGCAACAGAGTG
 GAGTGAAGGACACCAAGGAGGCCCTGGAGAAGCTGGAGGAGGAGCAAGTCCACAGAGAACCCAGCAGGCCCGCCGCGCACAAAGG
 CGTGTCAGAACTACCCCATCGTGCAGAACCTGCAGGGCCAGATGGTGCAACAGGCCATCTCCCCCGCACCCCTGAACGCTGGTGAAGG
 TGATCGAGGAGAAGCCTTCTCCCCGAGGTGATCCCCATGTTCTCCGCCCTGTCCGAGGGCGCCACCCCGAGGACCTGAACACCATGCTG
 AACCCGTGGCGGCCACCAAGCCGCCATGCAGATGCTGAAGGACACCATCAACGAGGAGCGCGGAGTGGGACCGCTGACCCCGTGCA
 CGCCGCCCATCCCCCGGCCAGATGCGCGAGCCCCCGGCTCCGACATCGCCGGCACCATCTCACCTGCAGGAGCAGATCCAGTGGA
 TGACCTCCAAACCCCGTGGCGGACATCTACAAGCGCTGGATCATCTGGGCTGAACAAGATCGTGCGCATGTACTCCCCCGTG
 TCCATCTGGACATCCGCCAGGGCCCAAGGAGCCCTTCGCGACTACGTGGACCGCTTCTCAAGACCCCTGCGCGCCGAGAGGCCACCCA
 GGAGTGAAGGGTGGATGACCGACACCCCTGTGGTGAGAACGCCAACCCCGACTGCAAGACCATCTGAAGGCCCTGGGCCCGCGGCCA
 CCCTGGAGGAGATGATGACCGCCTGCCAGGGCGTGGCGGCCGCGCCACAGGCCCGCGTGTGGCCGAGGCCATGTCCAGGCCACCAAC
 ACCGCCATCATGATGCAGAAGTCCAACTCAAGGGCCAGCGCCGATCGTGAAGTGTCAACTGCGGCAAGGAGGCCACATCGCCAAAGAA
 CTGCCGCGCCCCCGCAAGAAGGCTGTGGAAGTGGCGCCGAGGGCCACCAAGATGAAGGACTGCACCGAGCGCCAGGCCAACTTCCTGG
 GCAAGATCTGGCCCTCCAAACAAGGGCGCCCGGCAACTTCCTGCAGTCCCGCCCCGAGCCACCGCCCCCTCCCGCGGAGTCTTCGGCTTC
 CGCGAGGAGATCACCCCTCCCCCAAGCAGGAGCAGAGGCGCTGTACCCCCCTGGCCCTCCCTGAAGTCCCTGTTCGGCAACGA
 CCCCCTAA

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Fig. 71A

12. 2003 CON G gag. PEP

MGARASVLGKLDWEKIRLRPGGKKYRMKHLVWASRELERFALNPDLLLETAEGCQIMQLOPALQGTTEELRSLFNTVATLYCVHQRI
 EVKDTKEALEEVEKIQKKSQKTQQAAMDEGNSSQVSNYPVQNAQGMVHQAISPRILNAWKVVEEKAFSPEVIPMFSALSEGATPQDL
 NTMLNTVGGHQAAMQMLKDTINEEAAEWDRMHPPQAGPIPPQIIREPRGSDIAGTSTLQEQIRWMTSNPPIPVGEIYKRWIILGLNKIVRM
 YSPVSLDIRQGPKEPFRDYVDRFFKTLRAEQATQEVKGMWTDLLVQNAHPDCKTILRALGPGATLEEMMTACQGVGGPSHKARVLAEMS
 QASGAAAAMQKSNFKGPRRTIKFCNGKEGHLARNCRAPRKKGCWKCKEGHQMKDCTERQANFLGIWPSNKGPRGNFLQNRPEPTAPP
 AESFGFGEIEIAPSPKQEKEKELYPLASLKSIFGSDP\$

Fig. 71B

2003 CON G gag. OPT

ATGGCGCCCGCGCTCCGTGCTGTCCGGCGGCAAGCTGGACGCCCTGGGAGAAGATCCGCCCTGGCCCCGGCGGCAAGAAGTACCGCAT
 GAAGCACTGGTGGGCTCCCGGAGCTGGAGCGCTTCGCCCTGAACCCGACCTGTGGAGACCGCCGAGGCTGCCAGCAGATCATGG
 GCCAGCTGCAGCCCGCTGCAGACCGGACCGGAGCTGGCTCCCTGTTCAACACCGTGGCCACCTGTACTGCTGCACCAAGCGCATC
 GAGTGAAGACACCAAGAGGCCCTGGAGGAGGTGGAGATCCAGAAGTCCAGCAGAAGACCCAGAGGCCGCCATGGACGAGGG
 CAATCCTCCAGGTGTCCAGAACTACCCATCGTGCAGAACGCCAGGCCAGATGGTGCAACAGGCCATCTCCCCGCCACCTGAACG
 CCTGGGTGAAGTGTGGAGGAGAGGCCCTTCTCCCCGAGGTGATCCCCATGTTCTCCGCCCTGTCCGAGGGGCCACCCCCAGGACCTG
 AACACCATGCTGAACACCGTGGCGGCCACCAAGCCGCCATGCAGATGCTGAAGGACACCATCAACGAGGAGGCCCGCGAGTGGGACCGCAT
 GACCCCGAGAGCGGCCCATCCCCCGGCCAGATCCCGGAGCCCCCGGCTCCGACATCGCCGCCACCATCCACCTCCACCTGCAGGAGC
 AGATCCGCTGGATGACCTCAACCCCCCATCCCGTGGCGGAGATCTACAAGCGTGGATCATCTGGGCTGAACAAGATCGTGCGCATG
 TACTCCCCGTGTCCATCCTGGACATCCGCCAGGCCCGCAAGGAGCCCTTCCGCCACTACGTGGACCGCTTCTTCAAGACCTGCGCGCCGA
 GCAGGCCACCCAGAGGTGAAGGCTGGATGACCGACACCTGTGGTGCAAGAACGCCCAACCCGACTGCAAGACCATCTGCGCGCCCTGG
 GCGCGCGCCACCCCTGGAGGAGATGATGACCGCTGCCAGGGCGTGGCGGCCCTCCACAAAGGCCCGGTGCTGGCCGAGGCCATGTCC
 CAGGCTCCGGCGCCCGCCGATCATGATGAGAAAGTCCAACTTCAAGGGCCCCCGCCGACCATCAAGTGTCTCAACTGCGGCAAGGA
 GGGCACCTGGCCCGCAACTGCCGCGCCCGCCCGCAAGAGGGTGTGGAAGTGGGCAAGGAGGCCACCATGAGGACTGCACCGAGC
 GCCAGGCCAATCTCCGGCAAGATCTGGCCCTCCAAACAAGGGCGCCCGCGCAACTTCTGCAAGAACCGCCCGAGCCACCGCCCCCCCC
 GCGGAGTCTTCCGGCTTCGGCGAGGAGATCGCCCCCTCCCCCAAGCAGGAGCAGAGGAGAGCTGTACCCCCCTGGCCTCCCTGAAGTC
 CCTGTTCCGGCTCCGACCCCTAA

Fig. 72A

13. 2003 CON H gag. pep

MGARASVLSSGGKLD¹AW²EKIRL³RP⁴GGKKYRL⁵KHLV⁶WASRELERFALN⁷PGLLE⁸TAEGCLO⁹IEQLQPA¹⁰IKT¹¹GTEELQSL¹²FN¹³TVAVLYCVHQRI¹⁴
 DVKDTKEALGKIE¹⁵IQNKSQ¹⁶KTQQAAD¹⁷KEKDNKV¹⁸SONYPI¹⁹VQNAQGMV²⁰HQAI²¹SPRTLN²²AWKVVEEKAF²³SEV²⁴IPMFSALSEGAT²⁵PQDL²⁶
 NAMLNTVGGHQAA²⁷MQMLK²⁸DTINEEAAEW²⁹DR³⁰LHPVHAG³¹PIPPGQMPREPRGSD³²IA³³GT³⁴STLQEQIAWMTGN³⁵RPI³⁶PVGD³⁷IYKRW³⁸ILLGLNKIVRM³⁹
 YSPVSILDIKQGPKE⁴⁰FRDY⁴¹VDREF⁴²FKTLRAEQ⁴³ATQDVKNWMT⁴⁴DTLLVQNA⁴⁵NP⁴⁶DKTILRALGQ⁴⁷ASIEEM⁴⁸MTACQGVG⁴⁹SPSHKARVLA⁵⁰EAMS⁵¹
 QVTNANA⁵²AIMQKGN⁵³FKGPRKI⁵⁴VKCFNCGKEGHIARNC⁵⁵PRKKGCKW⁵⁶KGREGHQM⁵⁷KDCTERQAN⁵⁸FLGKI⁵⁹WPSSKGR⁶⁰PNFLQSRPEPTAPP⁶¹
 AESFGFGEEMTPSPKQELKDKEPPLASLRSLFGNDPLSQ\$

Fig. 72B

2003 CON H gag. OPT

ATGGCGC¹CGCGCCT²CGTGT³CCGGCGGCAAGCT⁴GGACGCC⁵TGGAGAAGAT⁶CCGCC⁷TGGCCCCCGCGGCAAGAAGATACCGCCT⁸
 GAAGACCTGGTGTGGCCT⁹CCCGAGCTGGAGCGCT¹⁰TCGCCCTGAACCCCGGCTGTGAGACCGCCGAGGGCTGCCCTGCAGATCATCG¹¹
 AGCAGCTGCAGCCCGCATCAAGACCGGCACCGAGGAGCTGCAGTCCCTGTTCAACACCGTGGCCGTGTACTGCGTGCAACCGCATC¹²
 GACGTGAAGGACACCAAGGAGGCCCTGGGCAAGATCGAGGATCCAGAACAGTCCAGCAGAAACCCAGAGGCCCGCCGCAAGGA¹³
 GAAGGACAA¹⁴CAAGGTGTCCAGAACTACCCCATCGTGCAAGACGCCAGGCCAGATGGTGCAACAGGCCATCTCCCCCGCACCTGAACG¹⁵
 CCTGGTGAAGTGGTGGAGGAGAGGCCCTTCTCCCCGAGGTGATCCCCATGTTCTCCGCCCTGTCCGAGGGGCCACCCCCAGGACCTG¹⁶
 AACGCCATGCTGAACACCGTGGCGGCCACCGCCGCTGCAGATGCTGAAGGACACCATCAACGAGGAGGCCCGCGAGTGGGACCGCCT¹⁷
 GCACCCCGTGACCGGCCAACCCCCCATCCCCCGGCGAGTCCCGGAGCCCGGCTCCGACATCGCCGGCACACCTCCACCTGCAGGAGC¹⁸
 AGATCGCCTGGATGACCGGCAACCCCCCATCCCCGTGGCGGACATCTACAAGCGCTGGATCATCTGGGCTGAACAAGATCGTGGCATG¹⁹
 TACTCCCCCGTGTCCATCCTGGACATCAAGCAGGGCCCCAAGGAGCCCTTCCGCGACTACGTGGACCGCTTCTTCAAGACCCCTGCGGCGCGA²⁰
 GCAGGCCACCCAGGACGTGAAGAACTGGATGACCGACACCTGCTGGTGCAAGCAACCCCGACTGAAGACCATCTGCGCGCCCTGG²¹
 GCCAGGGCGCCTCCATCGAGGAGATGATGACCGCTGCCAGGGCTGGCGGGCCCCCTCCACAAAGGCCCGCTGCTGGCGGAGGCCATGTCC²²
 CAGGTGACCAACGCCCACTCATGATGCAAGAGGCAACTTCAAGGGCCCCCGCAAGATCGTGAAGTGTCTCAACTGCGGCAAGGA²³
 GGGCCACATCGCCCGCAACTGCCGCGCCCCCGCAAGAGGCTGTGGAAGTGGCGCGGAGGGCCACCAAGATGAAGGACTGCACCGAGC²⁴
 GCCAGGCCAACTTCTGGGCAAGATCTGGCCCTCTTCAAGGGCGCCCCCGCAACTTCTGCAGTCCCGCCCGAGCCACCGCCCCCCCC²⁵
 GCCGAGTCTTCCGGCTTCCGGCAGGAGATGACCCCTCCCCCAAGCAGGAGCTGAAGGACAAGGAGCCCCCTGGCCTCCCTGGCCTCCCT²⁶
 GTTCGGCAACGACCCCTGTCCCAAGTAA

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Fig. 73A

14. 2003 CON K gag. PEP

MGARASVLGGKIDTWEKIRLRPGGKKYRLKHLVWASRELERFALNPSSLTETEGCRQIIROQLPSLQTSSEELKSLFNTVATLYCVHQRI
 EVRDTKEALDKLEEEONKSQQTQETADKGVSONYPIVQNLQGMVHQALSPTLNAMVKVIEEKAFSPEVIMFSALESEGATPQDLNTML
 NTVGGHQAAQMMLKDTINEEAAEWDRLHPVHAGPIPPGOMREPRGSDIAGTSTLQEQITWMTSNPPVPVGEIYKRWIIILGNKIVRMYSVP
 SILDIRQGPKEPFRDYDRFFKTLRAEQATQEVKNWMTDTLLVQANPDCKTILKALPGASLEEMMTACQGVGPGHKARILAEAMSQVTN
 TAVMMQRGNFKGQRKIIKFCNCGKEGHIAARNCRAPRKKGCWKCKEGHMKDCTERQANFLGKIWPSNKGPRGNFLQSRPEPTAPPAESFGF
 GEEITPSPROETKDEQGPPLTSLKSLFGNDPLSQ\$

Fig. 73B

2003 CON K gag. OPT

ATGGGCGCCCGCGCTCCGTGCTGTCCGGCGGAAGCTGGACACCTGGGAGAAAGATCGGCCTGGCCCCGGGGCAAGAAGTACCGCCT
 GAAGCACCTGGTGTGGGCTCCCGGAGCTGGAGCGCTTCGCCCTGAACCCCTCCCTGTGGAGACCACCGAGGGCTGCCGCCAGATCATCC
 GCCAGCTGCAGCCCTCCCTGCAGACCGGCTCCGAGGAGCTGAAGTCCCTGTTCACACCCGTGGCCACCCCTGTACTGCGTGACCCAGCGCATC
 GAGTGCGCGACACCAAGGAGGCCCTGGACAAGCTGGAGGAGGAGCAGAACAAGTCCAGCAGAAGACCCAGCAGGAGACCGCCGACAAAGGG
 CGTGTCCAGAACTACCCCATCGTGCAGAACCTGCAGGGCCAGATGGTGCACCCAGGCCCTGTCCCCCGCACCCCTGAACGCCCTGGGTGAAGG
 TGATCGAGGAGAAGCCCTTCTCCCCGAGGTGATCCCCATGTTCTCCGCCCTGTCCGAGGGCGCCACCCCCAGGACCTGAACACCATGCTG
 AACACCGTGGCGGCCACCAAGGCCCATGCAGATGCTGAAGGACACCATCAACGAGGAGGCCCGCGAGTGGGACCGCTGCACCCCGTGCA
 CGCCGCCCATCCCCCGGCGAGATGCGCGAGCCCCCGGCTCCGACATCGCCGGCACCACTCCACCTGCAGGAGCAGATCACCTGGA
 TGACCTCCAACCCCGTCCCGTGGCGGAGATCTACAAGCGCTGGATCATCTGGGCTGAACAAGATCGTGGCATGTACCCCCGTG
 TCCATCCTGGACATCCGCCAGGCCCCAAGGAGCCCTTCGCGGACTACGTGGACCGCTTCTCAAGACCCCTGCGCGCCGAGGCCACCCCA
 GGAGGTGAAGAACTGGATGACCGACACCCCTGCTGGTGCAAGACGCCAACCCCGACTGCAAGACCATCTTCAAGACCCCTGCGCGCCGAGGCCACCCCA
 CCTGGAGGAGATGATGACCGCTGCGCAGGCGTGGCGGCCCGGCCACAAGGCCCGCATCTTGGCCGAGGCCCATGTCCCAGGTGACCCAA
 ACCGCCGTGATGATGACGCGCGCAACTTCAAGGGCCAGCGCAAGATCATCAAGTGTTCAACTGCGGCAAGGAGGCCACATCGCCCCGCAA
 CTGCCGCGCCCCCGCAAGAAAGGCTGCTGGAAGTGGGCAAGGAGGGCCACCAAGATGAAGACTGCACGAGCGCCAGGCCAACTTCTCTGG
 GCAAGATCTGGCCCTCCAAACAAGGCGGCCCGCGCAACTTCTGCAGTCCCGCCGAGCCCAACCGCCCCCGCGCGAGTCCCTTCGGCTTC
 GCGGAGGAGATCACCCCTCCCCCGCCAGGAGACCAAGGACAAGGAGCAGGGCCCCCCCCCTGACCTCCCTGAAGTCCCTGTTCGGCAACGA
 CCCCCGTGTCCAGTAA

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Fig. 74A

15. 2003 CON 01 AE gag. PEP
MGARASVLGGKIDAWEKIRLRPGGKKYRMKHLVWASRELERFALNPGLLETAEGCQIIEQLQSTLKTGSEELKSLFNTVATLWCVHQR
EVKDTKEALDKIEEVQNKSOQKTQAAAGTSSSKVSQNYPIVQNAQGMVHQPLSPRTLNAWKVVEEKGFNPEVIPMFALSSEGATPQDL
NMMLNIVGGHQAAMQMLKETINEEAAEWDRVHPVHAGPIPPGQMRPRGSDIAGTTSTLQEQIGWMTNNPPIPVGDIYKRWIIILGLNKIVRM
YSPVILDIRQPKPEFRDYVDRFYKTLRAEQATQEVKNWMTETLLVQNPDPCKSILKALGTGATLEEMTACQGVGGPSHKARVLAEMS
QAOHANIMQRGNEFKQKRIKCFNCGKEGHLARNCRAPRKKGCKWCKGEGHQMCKDCTERQANFLGKIWPSNKGPRGNFPQSRPEPTAPPAEN
WGMGEIITSLPKQEQKDKHEPPPLVLSLKEGNDPLSQS

Fig. 74B

2003 CON 01 AE gag. OPT
ATGGCGCCCGCGCTCCGTGCTGTCGGCGGCAAGCTGGACGCCCTGGGAGAAGATCCGCCCTGCGCCCCCGCGGCAAGAAGTACCGCAT
GAAGCACTGGTGTGGCCCTCCCGGAGCTGGAGCGCTTCGCCCTGAACCCCGGCTGCTGGAGACCGCGAGGGTGGCCAGCATCATCG
AGAGCTGCAGTCCACCTGAAGACCGGCTCCGAGGAGCTGAAGTCCCTGTTCAACACCGTGGCCACCTGTGGTGGTGCACCGCATC
GAGGTGAAGGACACCAAGAGGCCCTGGACAAGATCGAGGAGTGCAGAACAAAGTCCAGCAGAACCCAGAGCCCTGTCCCCCGCACCTGAACG
CTCCTCCTCAAGGTGTCAGAACTACCCCATCGTGCAGAACGCCAGGGCCAGATGGTGACACAGCCCTGTCCCCCGCACCTGAACG
CCTGGGTGAAGTGGTGGAGAGAGGGCTTCAACCCGAGGTGATCCCATGTTCTCCGCTGTCCAGGGCCCAACCCCGAGGACCTG
AACATGATGCTGAACATCGTGGCGGCCACCAAGCGGCCATGCAGATGCTGAAGGAGACCATCAACGAGGAGGCCCGGAGTGGGACCGCGT
GCACCCCGTGCACCGCGGCCATCCCCCGGCAGATGCGGAGCCCCCGGCTCCGACATCGCCGGCACCATCTCCACCTGCAGGAGC
AGATCGGTGGATGACCAACACCCCCCATCCCCGTGGGACATCTACAAGCGCTGGATCATGCTGGCCTGAACAAGATCGTGGCATG
TACTCCCCGTGTCATCCTGGACATCCGCCAGGGCCCCAAGGAGCCCTTCCGCGACTACGTGGACCGCTTCTACAAGACCCCTGCGGCCGA
GCAGGCCACCCAGAGGTGAAGACTGGATGACCCGAGACCCCTGCTGGTGCAGAACGCCAACCCCGACTGGAAGTCCATCCTGAAGGCCCTGG
GCACCGCGCCACCTGGAGGAGATGATGACCGCTGCCAGGGCTGGCGGCGCCCTCCACAAAGGCCCGCTGCTGGCCGAGGCCATGTCC
CAGGCCAGCACGCCAATCATGATGACGCGCGGCACTTCAAGGGCCAGAAGCGCATCAAGTCTTCACTGCGGCAAGGAGGGCCACCT
GGCCCGCACTGCCGCGCCCTCCGCAAGAGGGCTGCTGGAAGTGGGCAAGGAGGCCACCATGAAGGACTGCACCGAGCGCCAGGCCA
ACTTCTGGCAAGATCTGGCCCTGCAACAAGGGCGGCCCGGCAACTTCCCCAGTCCCCCGGAGCCACCGCCCCCGCGGAGAAC
TGGGGCATGGCGAGGAGATCACCTCCCTGCCCAAGCAGGAGCAGAGGACAAAGGAGCACCCCCCCCCCTGGTGTCTCCTGAAGTCCCTGTT
CGGCAACGACCCCTGTCCCAAGTAA

Fig. 75A

16. 2003 CON 02 AG gag . PEP

MGARASVLGGKLD~~AW~~EKIRLRPGGKKYRLKHLVWASRELERFALNPGLLETAEGCQOIMEQLQSALRTGSEELKSLYNTVATLWCVHQRI
 DIKDTKEALDKIEVQNKSKQKTQAAAAATSSSSQNYPIVQNAQGQMTQHSMSPRTLN~~AW~~VKVIIEKAFSP~~EVI~~PMFSALSEGATPQDLNMM
 LNI~~V~~GGHQAAMQMLKDTINEEAAEDRVHPVHAGPIPPGQMPREPRGSDIAGTTSTLQEQIGWMTSNPPIPVGEIYKRWIVLGLNKIVRMYS
 VSILDIRQGPKEPRFDYVDRFFKTLRAEQATQEVKNWMTETLLVQANANPDCKSILRALPGATLEEMTACQGVGGPGHKARVLAEAMSQVQ
 QSNIMQ~~R~~GNFRGQRTIKCFNCGKEGHLARNCKAPRKKGCKGKEGHQMKDCTERQANFLGKIWPSSKGRPGNFPQSRPEPTAPAESFGM
 GEEITSPKQEP~~R~~DKGLYPPLTSLKSLFGNDP\$

Fig. 75B

2003 CON 02 AG gag . OPT

ATGGCGCGCGCCTCCGTGCTGTCCGGCGGCAAGCTGGACGCCCTGGGAGAAGATCCGCCCTGCGCCCCCGCGGCAAGAAGTACCGCCT
 GAAGCACCTGGTGGCCTCCCGGAGCTGGAGCGCTTCGCCCTGAACCCCGGCTGTGAGACCGCCGAGGGCTGCCAGCAGATCATGG
 AGCAGTGCAGTCCGCTCGCACCGGCTCCGAGGAGTGAAGTCCCTGTACAAACCCGTGGCCACCTGTGGTGGTGCAACAGCGCATC
 GACATCAAGGACACCAAGGAGGCCCTGGACAAAGATCGAGGAGTGCAGAACAAAGTCCAAAGCAGAACCCAGAGCGCCGCCGCCACCGG
 CTCCTCTCCAGAACTACCCCATCTGTGCAGAACGCCAGGCCAGATGACCCACAGTCCATGTCCCCCGCACCTGAACGCCCTGGGTGA
 AGTGATCGAGGAGAAGCCTTCTCCCCGAGGTGATCCCCATGTTCTCCGCCCTGTCCGAGGGCGCACCCCGCAGGACCTGAACATGATG
 CTGAACATCTGTGGCGGCCACAGCGGCCATGCGAGATGCTGAAGGAGACCATCAACGAGGAGCGCCGAGTGGGACCGCGTGCAACCCCGT
 GCACGCCGCCCATCCCCCGGCCAGATGCGCGAGCCCCCGGCTCCGACATCGCCGACACCTCCACCTGCAGGAGCAGATCGGCT
 GGATGACCTCCAAACCCCATCCCCGTGGCGGAGATCTAAAGCGCTGGATCGTGTGGGCTTGAACAAGATCGTGCGCATGTACTCCCC
 GTGTCCATCTGGACATCCGCCAGGGCCCCAAGGAGCCCTTCCGCGACTACGTGGACCGCTTCTTCAAGACCTCGCGCGCAGCAGGCCAC
 CCAGGAGGTGAAGAACTGGATGACCGAGACCTGTGTGGTGAGAACGCCAACCCGACTGCAAGTCCATCTGCGCGCCCTGGGCCCGGCG
 CCACCTGGAGGAGATGATACCGCTGCCAGGGCGTGGCGGCCCGGCCAACAGGCCCGCGTGTGCGCGAGGCCATGTCCCAGGTGCAG
 CAGTCCAAACATCATGATGCAGCGCGGCAACTTCCGCGGCCAGCGCACCATCAAGTGTCTCAACTGCGGCAAGGAGGGCCACCTGGCCCCGCAA
 CTGCAAGGCCCCCGCAAGAAGGGCTGCTGGAAGTGGGCAAGGAGGGCCACCAAGATGAAGGACTGCACCGAGCGCCAGGCCAACTTCCTGG
 GCAAGATCTGGCCTCTCCAGGGCGGCCCGGCAACTTCCCCCAGTCCCCCGCCGAGCCACCGCCCGGAGTCCCTTCGGCATG
 GCGGAGGAGATCACCTCCTCCCCCAAGCAGGAGCCCCCGGACAAAGGCCCTGTACCCCCCTGACCTCCCTGAAGTCCCTGTTCGGCAACGA
 CCCCTAA

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Fig. 76A

17. 2003 CON 03 ABG gag. PEP

MGARASVL⁵SGGKLD¹AW²EKIRL³PGGKKYRIKHLVWASRELERFALNP⁴SLLETSEGCQ⁵QILEQ⁶LQ⁷PTLKTGSEELKSLYNTVATLYCVHQRI
 EIKDTKEALDKIEEIQNKSKQKTQQAATGTGSSSKVSQNYPIVQNAQGMTHQSMSPRTLN⁸AWKVIEEKA⁹FSPEVIPMF¹⁰SALSEGATPQDL
 NMMLNIVGGHQAA¹¹QMLKDTINEEAAEWDR¹²LHPAQAGFPFPGQMREPRGSDIAGTT¹³SLQEIQIGWMTSNPPIPVGDIYKRWIILGLNKIVRM
 YSPVILDIRQPKPEFRDYVDRFFKTLRAEQATQDVKNWMTETLLVQNPANPDCKTILRALGSGATLEEM¹⁴TACQGVGGPGHKARVLAEAMS
 QVQ¹⁵NANIMMQ¹⁶SNFERGPKRIKCFNCGKDGHLARNCRAPRKGKWC¹⁷KGEGHQMKDCTERQANFLGRIPWSSKGRPGNEFPQSRPEPSAPPAEN
 FGMGEETPSLKQEQKDR¹⁸EQHP¹⁹PSISLSLFGNDPLSQ\$

Fig. 76B

2003 CON 03 ABG gag. OPT

ATGGCGCCCGCGCCTCCGTGCTGTCCGGGGGCAAGCTGGACGCCTGGGAGAAAGATCCGCCTGCGCCCCGGGGCAAGAAGATACCGCAT
 CAAGCACTGGTGTGGCCCTCCCGGAGCTGGAGCGCTTCGCCCTGAACCCCTCCCTGTGGAGACCTCCGAGGGCTGCCAGCAGATCCTGG
 AGCAGCTGCAGCCCACTGAAGACCGGCTCCGAGGAGCTGAAGTCCCTGTACAACACCGTGGCCACCCCTGTACTGCGTGCAACGCGCATC
 GAGATCAAGGACACCAAGGAGGCCCTGGACAAGATCGAGGAGATCCAGAACAAGTCCAAGCAGAAGACCCAGCAGGCCGCCACCGGCACCGG
 CTCCTCCTCCAAGGTGTCCAGAACTACCCCATCGTGAGAACGCCAGGGCCAGATGACCCACCATGTCTCCGCCCTGTCCGAGGGGCCACCCCGCAGGACCTG
 CCTGGGTGAAGGTGATCGAGGAGAAAGGCCCTTCTCCCCGAGGTGATCCCCATGTCTCCGCCCTGTCCGAGGGGCCACCCCGCAGGACCTG
 AACATGATGCTGAACATCGTGGCGGCCACAGGCCGCTGAGATGCTGAAGGACACCATCAACGAGGAGGCCGCCAGCTCCACCTGCGAGGAGC
 GCACCCCGCCAGGCCGCCCTTCCCCCGGCGCAGATGCGCGGAGCCCCCGGCTCCGACATCGCCGGCTGAACAAGATCGTGCGCATG
 AGATCGGCTGGATGACCTCAACCCCCCATCCCCGTGGCGGACATCTACAAGCGCTGGATCATCCTGGGCTGAACAAGATCGTGCGCATG
 TACTCCCCGTGTCATCCTGGACATCCGCCAGGGCCCCAAGGAGCCCTTCCGCGACTACGTGGACCGCTTCTTCAAGACCTGCGCGCCGA
 GCAGGCCACCCAGGACGTGAACACTGGATGACCGAGACCTGCTGTGTCAGAAAGCCCAACCCGACTGCAAGACCATCTGCGCGCCCTGG
 GCTCCGGCGCCACCTGGAGGAGATGATGACCGCTGCCAGGGCTGGCGGGCCCCCGGCCACAAGGCCCGGTGCTGGCCGAGGCCATGTCC
 CAGGTGCAGAACGCCAACATCATGATGCAGAGTCCAACTTCCGCGGCCCAAGCGCATCAAGTGTCTTCAACTGCGGCAAGGACGGCCACCT
 GGCCCGCAACTGCGCGCCCCCGCAAGAGGCTGTGGAAGTCCGGCAAGGAGGCCACCAAGATGAAGGACTGACCGAGCGCCAGGCCA
 ACTTCTTGGCGGCATCTGGCCCTCTCCAAGGGCGCCCCCGGCAACTTCCCCCAGTCCCGCCCCGAGCCCTCCGCCCCCCCCCGCGAGAAC
 TTCGGCATGGCGGAGGAGATCACCCCTCCCTGAAGCAGGAGCAGAAAGGACCGGAGCAGCACCCCCCTCCATCTCCCTGAAGTCCCTGTT
 CGGCAACGACCCCTGTCCCCAGTAA

Fig. 77A

18. 2003 CON 04 CFX gag. PEP

MGARASVLGGKLD^{AW}IRLRPGGKKYRLKHLVWASRELERFALNPGILLETAEGCQQLMEQLQSTLKTGSEELKSLENTIATLWCVHQRI
 DVKDTKEALDKVEEMQNKSKQKTQAAADTGGSSNVSONYPIVQNAQGMVHQSI^{SP}RTLNAWKVIEEKA^{FS}PEVIPMFSALSEGATPQDL
 NMMLNIVGGHQAA^{QM}MLKDTINEEAAEWDRAPVHAGPIPPGQMRPRGSDIAGTTSTLQEQIGWMTSNPPIPVGEIYKRWIILGLNKIVRM
 YSPVSILDIRQPKPEFRDYVDRFFKCLRAEQATQEVKNWMTETLLVQNA^{NP}DPCKSILKALGTGATLEEMMTACQGVGGPSHKARVLA^{EA}MS
 QASNA^{AA}AIMMQKS^{NF}KQORRI^{IK}CFNCGKEGHLARNCRAPRKKGCKGEGHQM^{KD}CTERQANFLGRMPSSKGRPGN^{FL}QSRPEPTAPP
 AESLEMK^{EE}TSSPKQEPRDKELYPLTSLKSLFGSDPLSQ^S.

Fig. 77B

2003 CON 04 CFX gag. OPT

ATGGCGCGCGGCTCCGTGCTGTCCGGCGGCAAGCTGGACGCTGGAGCGCATCCGCTGCGCCCCGGCGGCAAGAAGTACCGCCT
 GAAGCACCTGGTGTGGGCTCCCGGAGCTGGAGCGCTTCGCCCTGAACCCGGCCTGTGGAGACCGCGGAGGCTGCCAGCAGCTGATGG
 AGCAGCTGCAGTCCACCTGAAGACCGGCTCCGAGGAGCTGAAGTCCCTGTTCAACACCATCGCCACCTGTGGTGGTGCCACCGGCATC
 GACGTGAAGGACACCAAGGAGGCCCTGGACAAGGTGGAGGAGATGCAGAACAAAGTCCAAAGACCAAGAGACCGAGCGGCCGCCGACACCGG
 CGGCTCCTCCAACTGTCAGAACTACCCCATCTGTGAGAACCGCCAGGCGCAGATGGTGCACCATCTCTCCCCCGACCCCTGAACG
 CCTGGGTGAAGTGATCGAGGAGAGGCTTCTCCCCGAGGTGATCCCATGTTCTCCGCTGTCCGAGGGCGCCACCCCTGAGGACCTG
 AACATGATGCTGAACATCGTGGCGGCCACAGGCCCATGCAGATGCTGAAGGACACCATCAACGAGAGGCGCCGAGTGGGACCGCGC
 CCACCCGCTGCACCGCGGCCATCCCCCGGCGAGTGGCGGCTCCGACATCGCCGGGACCACTCCACCTCCACCTGCAGGAGC
 AGATCGGCTGGATGACCTCCAAACCCCTCATCCCGTGGCGGAGATCTACAAGCGTGGATCATCTCTGGGCTGAACAAGATCGTGGCGCATG
 TACTCCCCGTGTCATCTCTGGACATCCGCGAGGCCCTTCCGCGACTACGTGGACCGCTTCTTCAAGTGCCTGCGGCGCGGA
 GCAGGCCACCCAGGAGTGAAGAACTGGATGACCGGAGACCTGCTGCTGTCAGAACGCCAAGTCAAGTCACTGAAAGGCCCTGG
 GCACCGCGCCACCTGGAGGAGATGATGACCGCTGCCAGGCGTGGCGGCCCTCCACAAGGCCCGCTGTGTGGCCGAGGCCATGTCC
 CAGGCTCCAAACGCCCGCGCCCATCATGATGCAGAAAGTCCAACTTCAAGGGCCAGCGCCGATCATCAAGTGTCTCAACTGCGGCAAGGA
 GGGCACCTGGCCCGCAACTGCCGCGCCCTCCGCAAGAAAGGCTGCTGGAAGTGGCGCAAGGAGGCCACAGATGAAGGACTGCACCGAGC
 GCCAGGCCAACTTCTGGGCGCATGTGGCCCTCTCCAAAGGCGGCCCGGCAACTTCTGAGTCCGCGCCGAGCCACCGCCCCCCC
 GCCGAGTCCCTGGAGATGAAGGAGGAGACCACTCTCTCCCCAAGCAGGAGGCCCGCGACAAGGAGCTGTACCCCTGACCTCCCTGAAGTC
 CCTGTGGCTCCGACCCCTGTCCAGTAA

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Fig. 78A

19. 2003 CON 06 CPX gag .PEP

MGARASVLGGKLDWEKIRLRPGKKKRYRLKHLVWASRELERFALNPGLLETAEGCQOIIEQLQSALKTGSEELKSLYNTVATLYCVHQRI
 KVTDTKEALDKIEEIQNKSKQKAQAAATGNSSNLSQNYPIVQNAQGMVHQAI SPRTLNAWKVIEEKAFSPEVIPMFSALEGATPQDL
 NMMLNIVGGHQAAQMMLKDTINEEAAEWDRVHPVHAGPIPPGOMREPRGSDIAGTTSILOEQIGWMTSNPPPIPVGEIYKRWIILGLNKIVRM
 YSPVSLDIRQGPKEPRDYDRFFKTLRAEQATQEVKNWMTDILLVQANPDCKTILKALGPGATLEEMMTACQGVGGPGHKARVLAEAMS
 QASGTEAAIMMQSNSFKPKRSIKCFNCGKEGHLARNCRAPRKKGCWKCKEGHQMKDCTERQANFLKIWPSNKGPRPGNLFQNRPEPTAPP
 AESFGFGEETAPSPKQEPKEKELYPLASLSLFGNDP\$

Fig. 78B

2003 CON 06 CPX gag .OPT

ATGGCGCGCGGCGCTCCGTGCTGTCCGGCGGCAAGCTGGACGAGTGGGAGAAGATCCGCCCTGGCCCCGGCGGCAAGAAGTACCGCCT
 GAAGCACCTGGTGTGGGCTCCCGGAGCTGGAGCGCTTCGCCCTGAACCCCGGCTGTGAGACCGCCGAGGGCTGCCAGCATCATCG
 AGCAGCTGCAGTCCGCCCTGAAGACCGGCTCCGAGGAGCTGAAGTCCCTGTACAACACCGTGGCCACCTGTACTGCGTGCACCCAGCGCATC
 AAGGTGACCGACACCAAGGAGGCCCTGGACAAGATCGAGGAGATCCAGAACAGTCCAAGCAGAGGCCAGCGGCCGCGCCGCCACCGG
 CAACTCCTCCAACTTCCAGAACTACCCCATCGTGCAGAACGCCAGGCCAGATGGTGCAACAGGCCATCTCCCCCGCACCTGAACG
 CCTGGGTGAAGTGTGAGGAGAGGCTTCTCCCCGAGGTGATCCCCATGTTCTCCGCCCTGTCCGAGGGCGCCACCCCCAGGACCTG
 AACATGATGCTGAACATCGTGGCGGCCACCGCCCATGCAGATGCTGAAGACACCATCAACGAGGAGGCCCGCGAGTGGGACCCGCT
 GCACCCCGTGCACGCCGCCCATCCCCCGGCCAGATGCGCGAGCCCCCGGCTCCGACATCGCCGGCACCCACCTCCACCTGCAGGAGC
 AGATCGGCTGGATGACCTCCAAACCCCATCCCCGTGGCGGAGATCTACAAGCGCTGGATCATCTCTGGGCTGAACAAGATCGTGCAGATG
 TACTCCCCGTGTCCATCTGGACATCCGCCAGGGCCCCAAGGAGCCCTTCCGCCGACTACGTGGACCGCTTCTCAAGACCTGCGCGCCGA
 GCAGGCCACCCAGGAGGTGAAGAACTGGATGACCGACACCCCTGCTGGTGCAGAACGCCAACCCCGACTGCAAGACCATCTGAAGGCCCTGG
 GCCCGGCGCCACCCCTGGAGGAGATGATGACCGCTGCCAGGGCGTGGCGGCCCGGCCCAAGGCCCGCTGTGCTGCGGAGGCCATGTCC
 CAGGCTCCGGCACCGAGCGCCCATCATGATGCAAGATCCAACTTCAAGGGCCCCAAGCGCTCCATCAAGTGTCTCAACTGCGGCAAGGA
 GGGCCACCTGGCCCGCAACTGCCCGCCCCCGCAAGAGGCTGTGGAAGTGGGCAAGGAGGCCACCAAGATGAAGGACTGCACCCGAGC
 GCCAGGCCAACTTCTGGGCAAGATCTGGCCCTTCCAACAAGGGCGGCCCGCGCAACTTCTCTGAGAACCGCCCGAGCCACCGCCCCCCC
 GCAGAGTCTTCCGCTTCGGCGAGGAGACCGCCCTCCCCCAAGCAGGAGGCCCAAGGAGAGCTGTACCCCTGGCCTCCCTGAAGTC
 CCTGTTCCGGCAACGACCCCTAA

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Fig. 79A

20. 2003 CON 07 BC gag. PEP

MGARASILRGGLDKWEKIRLRPGGKKHYMLKHLVWASRELERFALNPGLLETSEGCKQIIKQLPALQQTGEELRSLFNTVATLYCVHTEI
 DVDRDTEALDKIEEEQNKIQKTQQAKEADGKVSQNYPIVONLQGMVHQPISPRTLNAWVKVVEEKAFSPEVIPMFSALSEGATPQDLNMT
 LNTVGGHQAAQIILKDTINEEAAEWDRLHPVHAGPIAPGQMRPRGSDIAGTTSNLQEQIAWMTSNPPVPVGDIIYKRWIIILGINKIVRMYS
 TSILDIKQGPKEPRDYVDFEFTLRAEQATQDVKNWMTDTLLVQANPDCKTILRALPGASIEEMMTACQGVGGPSHKARVLAEAMSQTN
 STILMQRSNFSGKRIVKFCNCGKEGHIARNCRAPKKGCKGKEGHQMKDCTERQANFLGKIWPESHKGRPGNLFQSRPEPTAPPEESFRF
 GEETTPSQKQEPIDKELYPLTSLKSLFGNDPSSQ\$

Fig. 79B

2003 CON 07 BC gag. OPT

ATGGGCGCCCGCGCCTCCATCCTGCGGCGGCGCAAGCTGGACAAGTGGGAGAAGATCCGCCCTGCGCCCCGGGCAAGAAAGCACTACATGCT
 GAAGCACCTGGTGTGGGCTCCCGGAGCTGGAGCGCTTCGCCCTGAACCCCGGCTGCTGGAGACCTCCGAGGGCTGCAAGCAGATCATCA
 AGAGCTGCAGCCCGCTGCAGACCGGACCGAGGAGCTGCGCTCCCTGTTCAACACCGTGGCCACCTGTACTGCGTGACACCGGAGATC
 GACGTGCGCGACACCAAGGAGGCCCTGGACAAAGATCGAGGAGGAGCAGAACAAAGATCCAGCAGAAGACCCAGCAGGCCAAGGAGGCCGACGG
 CAGGTGTCCAGAACTACCCATCTGTGCAGAACCTGCAGGGCCAGATGGTGCACAGCCCATCTCCCCCGCACCTGAACGCTGGGTGA
 AGTGGTGGAGGAGAAGGCTTCTCCCCGAGGTGATCCCCATGTTCTCCGCCCTGTCCGAGGGCGCCACCCCGAGGACCTGAACACCATG
 CTGAACACCGTGGGCGGCCACAGGCCCATCGAGATCTGAAGGACACCATCAACGAGGAGGCCCGCGAGTGGGACCGCTGCACCCCGT
 GCACGCCGCCCATCGCCCCCGGCCAGATGGCGAGCCCCCGGCTCCGACATCGCCGGCACCACTCCAACTGCAGGAGCAGATCGCCT
 GGATGACCTCCAAACCCCGTGCCTGGCGGACATCTACAAGCGCTGGATCATCTCGGCCCTGAACAAGATCGTGCGCATGTACTCCCC
 ACCTCCATCCTGGACATCAAGCAGGCGGCCCAAGGAGCCCTTCGCGACTACGTGGAGCGCTTCTTCAAGACCTCGCGCGCCGAGCGCCAC
 CCAGGACGTGAAGAATGGATGACCGACACCTGCTGTTGCAAGACGCCAACCCTGACTCAAGACCATCTGCGCGCCCTGGGCCCCGGCG
 CCTCCATCGAGGAGATGATGACCGCTCCAGGGCGTGGCGGCCCTCCCAAGGCCCGTGTGCGCGAGGCCATGTCCCAGACCAAC
 TCCACCATCCTGATGACGCTCCAACTCAAGGGCTCCAAGCGCATCGTGAAGTCTTCACTGCGGCAAGGAGGCCACATCGCCCCGCAA
 CTGCGCGCCCCCGCAAGAGGCTGCTGGAAGTGGGCAAGGAGGCCACAGATGAAGACTGCACGAGGCCAGGCCAACTTCTG
 GCAAGATCTGGCCCTCCACAAAGGGCGCCCGGCAACTTCTGAGTCCGCGCCGAGCCACCGCCCCCGGAGGAGTCTTCCGCTTC
 GCGAGGAGACCAACCCCTCCCAAGAGCAGAGGCCCATCGACAAGAGCTGTACCCCTGACCTCCCTGAAGTCCCTGTTCCGCAACGA
 CCCCTCTCCAGTAA

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Fig. 80A

21. 2003 CON 08 BC gag. PEP

MGARASILRGKLDKWEKIRLRPGGKHHYMLKHLVWASRELERFALNPGLLETSEGCKQIIKQLPALQGTGEELRSLFNTVATLYCVHAEI
 EVRDTKEALDKIEEENKIQKTQQAKEADEKVSQNYPIVQNLQGMVHQPLSPRTLNAWVKVVEEKAFSPVIMFTALSEGATPQDLNTM
 LNTVGHHQAAQMMLKDTINEEAAEWDRLHPVHAGPVAPGQMPREPRGSDIAGTTSTLQEQIGWMTNNPPIPVGEIYKRWIILGLNKIVRMYS
 TSILDIKQGPKEPRDYDRFFKTLRAEQATQDVKNWMTDILLVQANPDCKTILRALPGASLEEMMTACQVGGPSHKARVLAEAMSQTN
 NTILMQRSNFSGSKRIVKFCNCGKEGHIAKNCRAPRKKGCKGKEGHQMKDCTERQANFLGKIWPSHKGRPGNFIQSRPEPTAPPAESFRE
 EETTPAPKQEPKDREPLTSLRSLFGSDPLSQS

Fig. 80B

2003 CON 08 BC gag. OPT

ATGGGCGCCCGGCTCCATCCTGCGCGGGCGCAAGCTGGACAAGTGGGAGAAGATCCGCCCTGGCCCCCGGCAAGACACTACATGCT
 GAAGCACCTGGTGTGGGCTCCCGGAGCTGGAGCGCTTCGCCCTGAACCCCGGCTGTGGAGACCTCCGAGGGCTGCAAGCAGATCATCA
 AGCAGCTGCAGCCCGCTGCAGACCGGCACCGAGGAGCTGGCTCCCTGTTCACACCGTGGCCACCTGTACTGCGTGACGCCGAGATC
 GAGGTGCGCGACACCAAGGAGGCCCTGGACAAGATCGAGGAGGAGCAGAACAAAGATCCAGCAGAGAAGACCCAGCAGGCCAAGGAGGCCGACGA
 GAAGGTGTCCAGAACTACCCATCTGTGCAGAACCTGCAGGGCCAGATGGTGACACCGCCCTGTCCCCCGCACCTGACCGCTGGGTGA
 AGTGGTGGAGGAGAAGGCTTCTCCCCGAGGTGATCCCCATGTTACCGCCCTGTCCGAGGGCGCCACCCCCAGGACCTGAACACCATG
 CTGAACACCGTGGCGGGCCACAGGCCCGCATGCAGATGCTGAAGGACACCATCAACGAGGAGGCCCGGAGTGGGACCCGCTGCACCCCGT
 GCACGCCGCGCTGGCCCCCGGCGAGATGCGGAGCCCCCGGCTCCGACATCGCCGGCACCACTCCACCTGCAGGAGCAGATCGGCT
 GGATGACCAAGAACCCCGCATCCCGTGGCGGAGATCTACAAGCGCTGGATCATCTGGGCTGAACAAGATCGTGCGCATGTACTCCCC
 ACCTCCATCCTGGACATCAAGCAGGGCCCCAAGAGCCCTTCCCGGACTACGTGGACCGCTTCTTCAAGACCTTGGCGCCGAGAGGCCAC
 CCAGGACGTGAAGAATGGATGACCGACACCTTGTGGTGAGAACGCCAACCCCGACTGCAAGACCATCTGCGCGCCCTGGGCCCCGGCG
 CCTCCCTGGAGGAGATGATGACCGCTTGCAGGGCGTGGGCGGCCCCCTCCCAACAAGCCCCGCTGTGGCGGAGGCCATGTCCAGACCAAC
 AACACCATCCTGATGACGCTCCAACTCAAGGGCTCAAGCGCATCTGAAGTGTCTCAACTGCGGCAAGGAGGCCACATCGCCAAGAA
 CTGCGCGCCCCCGCAAGAAGGCTGCTGGAAGTGGGCAAGGAGGCCACCAAGATGAAGACTGCACCGAGGCCAGGCCAACTTCTCTGG
 GCAAGATCTGGCCCTCCCAACAAGGGCCCCCGGCAACTTCTGTGAGTCCCGCCCCGAGCCACCGCCCCCGGAGTCTTCCGCTTC
 GAGGAGACCAACCCCGCCCCCAAGCAGGAGCCCAAGGACCGGAGCCCTGACCTCCCTGCGCTCCCTGTTCCGCTCCGACCCCTGTCCCA
 GTAA

Fig. 81A

22. 2003 CON 10 CD gag.PEP

MGARASVL^{SG}GGKLD^{EW}EKIRLRPGGKKYRLKHLVWASRELERFALNPGLLIETSEGCKQIIGQLQPAIQTGSSEIKSLYNTVATLYCVHERI
 KVTDTKEALDKIEEEQTKSKKKAQQAATADTGNSSQVSONYPIVQNLQOMVHQP^{LS}PR^{TL}NAWKVIEEKAFSP^{EV}IPMF^SALSEGATPPQDL
 NTMLNTVG^{HQ}AA^MQMLKETINEEAAEWDR^LHPVQAGPVAPGQIREPRGSDIAGTTSTLQEQIRWMTSNPPIPVGEIYKRWIILGLNKIVRM
 YSPVSILDIRQGPKEPFRDYVDRFYKTLRAEQASQDVKNWMTETLLVQANPDCKTILKALGPAATLEEMMTACQGVGGPSHKARVLA^{EAMS}
 QATSGNAIMMORGNF^{KPK}KI^IKCFNCGKEGHIAKNCRAPRKKGCKGREGHQMKDCTERQANFLGKIWPSNKGPRP^{GN}FLQSRPEPTAPPA
 ESFGFEEITPSQKEQKDKELHPLASLKS^{LF}GN^DPLSQ^S

Fig. 81B

2003 CON 10 CD gag.OPT

ATGGGCGCCCGCGCCTCCGTGCTGTCCGGCGGCAAGCTGGACGAGTGGAGAAAGATCCGCTTGGCCCCGGCGGCAAGAAGATACCGCCT
 GAAGCACTGGTGTGGGCTCCCGGAGCTGGAGCGCTTCCGCCCTGAACCCCGGCTGTGGAGACCTCCGAGGGCTGCAAGCAGATCATCG
 GCCAGCTGACCCCGCATCCAGACCGGCTCCGAGGAGATCAAGTCCCTGTACACACCGTGGCCACCTGTACTGCGTGACGAGCGCATC
 AAGGTGACCGACACCAAGGAGGCCCTGGACAAGATCGAGGAGGAGACCAAGTCCAAAGAAGAGGCCAGCAGGGCCACCGCCGACACCGG
 CAACTCCTCCAGGTGTCCAGAACTACCCCATCTGTCAGAACCTGCAGGGCCAGATGGTGCACCAAGCCCCTGTCCCCCGCACCTGAACG
 CCTGGGTGAAGGTGATCGAGGAGAGGCCCTTCTCCCCGAGGTGATCCCCATGTTCTCCGCTGTCCGAGGGGCCACCCCCAGGACCTG
 AACACCATGCTGAACACCGTGGCGGCCACCAAGCCCGCATGCGAGATGCTGAAGAGACCATCAACGAGGAGGCCGCGGAGTGGAGCCGCT
 GCACCCCGTGCAGGCGGCGCCCGTGGCCCCCGGCGAGATCCGCGAGCCCCGCTCCGACATCGCCGCGACCATCCACCTCCACCTGCAGGAGC
 AGATCCGCTGGATGACCTCCAAACCCCGCATCCCGTGGCGGAGATCTACAAGCGTGGATCATCCTGGGCTGAACAAGATCGTGGCGCATG
 TACTCCCCGTGTCCATCCTGGACATCCGCGAGGGCCCCAAGGAGCCCTTCCGCGACTACGTGGACCGCTTCTACAAGACCTGCGCGCCGA
 GCAGGCTCCCAAGGACGTGAAGAACTGGATGACCGAGACCCCTGTGTGCAGAAAGCCCAACCCGACTGCAAGACCATCTGAAGGCCCTGG
 GCCCGCGCCACCCCTGGAGGAGATGATGACCGCTGCCAGGCGTGGCGGCCCCCTCCACAAGGCCCGGTGTGTGGCCGAGGCCATGTCC
 CAGGCCACCTCCGGCAACGCCATCATGATGCAGCGCGCAACTTCAAGGGCCCCAAGAAGATCATCAAGTCTTCAACTGCGGCAAGGAGGG
 CCACATCGCCAAAGAACTGCCGCGCCCCCGCAAGAGGCTGTGGAAGTGGCGCGGAGGCCACCCAGATGAAGGACTGCACCGAGCGCC
 AGGCCAACTTCTGGGCAAGATCTGGCCCTCCAAAGGGCGCCCGGCAACTTCTGTGAGTCCGCGCCCGAGCCCAACCGCCCCCGCC
 GAGTCTTGGCTTCGGGAGGAGATCAACCCCTCCCAAGAGCAGGAGCAGAAGGAGCTGCACCCCTGGCCTCCCTGAAGTCCCT
 GTTCGGCAACGACCCCTGTCCAGTAA

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Fig. 82A

23. 2003_CON_11_CPX_gag.PEP
 gag.PEPMGARASVLSGGLDAWEKIRLPGGKKKRYRLKHLVWASRELERFAINPSLLETAEGCCQIMQLOPALGTGTEELRSLYNTVATL
 YCVHHRIEVKDTKEALDKIEIQNKSKQKKQAAADTGNSSKVSQNPVIVNAQGMVHQAISPRTLNWKVVEEKAFSPEVIMFSAISE
 GATPQDLNMLNIVGGHQAAQMMLKDTINEEAAEWDVHPVHAGPIPPGQMRPRGSDIAGTSTLOEQIGWMTGNPVPVGEIYRRWIIIG
 LNKIVRMYSVSIILDIRQGPKEPFRDYVDRFFKTLRAEQATQEVKSWMETLLIQNANPDCKSILRALPGATLEEMMTACQGVGGPGHKAR
 VLAEMSQQVTNIMMQRSNFKQKRIKFCNCGKEGHLARNCRAPRKKGCKGKEGHQMKDCTERQANFLGKIWPSSKGRPGNFIQSRPEP
 TAPPAESFGFGEIAPSPKQEPKEKELYPLTSLKSLFGSDPLSQ\$

Fig. 82B

2003_CON_11_CPX_gag.OPT
 ATGGGCGC_CCGGCGCTCCGTGCTGTCGGCGGCAAGCTGGACGCCCTGGAGAGAAGATCCGCCCTGGCGCCCGCGGCAAGAAGATACCGCCT
 GAAGCACCTGGTGGGCTCCCGGAGCTGGAGCGCTTCGCCCTGAACCCCTCCCTGCTGGAGACCGCCGAGGCTGCCAGCAGATCATGG
 GCCAGCTGCAGCCCGCCCTGGCACCGGACCGAGAGCTGCGCTCCCTGTACAACACCGTGGCCACCCCTGTACTGCGTGCAACCCGCATC
 GAGGTGAAGACACCAAGGAGGCCCTGGACAAGATCGAGGATCCAGAACAAGTCCAAGCAGAAGAAGCAGAGGCCGCCGCCGACACCGG
 CAACTCCTCCAAGGTGCCAGAACTACCCATCTGTGAGAACGCCAGGCCAGATGGTGACACGAGCCATCTCCCCCGCACCTGAACG
 CCTGGGTGAAGGTGGAGGAGAAGCCCTTCTCCCCAGGTGATCCCCATGTTCTCCGCCCTGTCCGAGGGGCCACCCCCAGGACCTG
 AACATGATGCTGAACATCGTGGGGGCCACAGGCCCGCATGCAGATGCTGAAGGACACCATCAACGAGGAGGCCGCCGAGTGGGACCGCGT
 GCACCCCGTGACGCCGCCCATCCCCCGGCCAGATGCCGAGCCCCCGGCTCCGACATCGCCGACACCCACCTCCACCCCTGCAGGAGC
 AGATCGGCTGGATGACCGGCAACCCCCCGTGCCCGTGGCGGAGATCTACCGCCGCTGGATCATCCTGGCCCTGAACAAGATCGTGCGCATG
 TACTCCCCGTGTCCATCCTGGACATCCGCCAGGGCCCCAAGGAGCCCTTCGCCGACTACGTGACCGCTTCTTCAAGACCTGCGCGCCGA
 GCAGGCCACCCAGGAGGTGAGTCTTGATGACCGAGACCCCTGCTGATCCAGAACGCCAACCCGACTGCAAGTCCATCTGCGCGCCCTGG
 GCGCGCGCCACCCCTGGAGGAGATGATGACCGCTGCCAGGCGTGGCGGCCCGCCGACAGGCCCGCGTGTGCTGGCCGAGGCCATGTCC
 CAGGTGCAGCAGACCAACATCATGATGACGCTCCAACCTCAAGGGCCAGAAGCGCATCAAGTGTCTCAACTGCGCAAGGAGGCCACCT
 GGCCCGCAACTGCCGCGCCCCCGCAAGAGGCTGTGGAAGTGGCAAGGAGGCCACCCAGATGAAGGACTGCACCGAGCGCCAGGCCA
 ACTTCTGGCAAGATCTGGCCCTCTCTCAAGGGCGCCCGCCGCAACTTCTGAGTCCCGCCCGAGCCACCGCCCCCCCCCGCGAGTCC
 TTCGGCTTCGGCGAGGAGATCGCCCCCTCCCCCAAGCAGGAGGAGCTGTACCCCTGACCTCCCTGAAGTCCCTGTTCGG
 CTCCGACCCCTGTCCAGTAA

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Fig. 83A

24. 2003 CON 12 BF.gag.PEP
 MGRASVLSGGEIDRWKIRLRPGGKKYRLKHIVWASRELERFAVNPGLLETSEGCRKIIGQLQPSLQTSSEELRSLYNTIAVLVYFVHQKV
 EVKDTKEALDKLEEEONKSQOKTQOAAADKGVSONYPIVONLOGMVHQALSPTLNWVKVVEEKAFSPVIFMFSALSEGATPQDLNMTML
 NTVGGHQAAQMQLKDTINEEAAEWDRLHPVHAGPIPPGQMPREPRGSDIAGTTSTLQEQIQWMTSNPPVPVGEIYKRWIILGLNKIVRMYSVP
 SILDIRQGPKEPFRDYVDRFFKTLRAEQATQEVKGWMTDTLLVQANPNDCKTILKALPGATLEEMMTACQGVGGPGHKARVLAEAMSQVTN
 TTVMQKSNFEGQRRIVKFCNCGKEGHIAKNCRAPRKKGCKGREGHQMKDCTERQANFLGKIWPSNKGPRGNFQNRPEPTAPPAESFGE
 GEEITPSPKQEQKDEGLYPPLASLSLFGNDP\$

Fig. 83B

2003 CON 12 BF.gag.OPT
 ATGGCGGCCCGCGCTCCGTGCTGTCCGGCGGCGAGCTGGACCGCTGGGAGAAGATCCGCCTGGCCCCCGGGCAAGAAGTACCGCCT
 GAAGCACATCGTGTGGGCTCCCGAGCTGGAGCGCTTCGCCGTGAACCCGGCTGCTGGAGACCTCCGAGGCTGCCGCAAGATCATCG
 GCCAGCTGCAGCCCTCCCTGCAGACCGGCTCCGAGGAGTGGCTGTGTACAAACACCATCGCCGTGTGTACTTGTGCACCCAGAGGTG
 GAGGTGAAGGACACCAAGGAGGCCCTGGACAACTGGAGGAGAGCAAGTCCAGCAGAAGACCCAGCAGGCCGCCGCCGACCAAGG
 CGTGTCCAGAACTACCCCATCGTGCAGAACTGCAGGGCCAGATGGTGCACCAAGGCCCTGTCCCCCGACCTGAACGCTGGGTGAAGG
 TGGTGGAGGAGAAGGCTTCTCCCCGAGGTGATCCCCATGTTCTCCGCCCTGTCCGAGGGCGCCACCCCCAGGACCTGAACACCATGCTG
 AACACCGTGGCGGCCACCAAGCGCCATGCAGATGCTGAAGGACACCATCAACGAGGAGGCCGCCGAGTGGGACCGCTGCACCCCGTGCA
 CGCCGGCCCATCCCCCGGCAGATGCGGAGCCCCCGGCTCCGACATCGCCGCAACCACTCCACCTGCAGGAGCAGATCCAGTGGA
 TGACCTCCAACCCCCCGTCCGTGGCGAGATCTACAAGCGCTGGATCATCTGGGCCGTGAACAAGATCGTGGCATGTACTCCCCCGTG
 TCCATCTGGACATCCGCCAGGGCCCCAAGAGCCCTTCCGCGACTACGTGGACCGCTTCTCAAGACCTTGGCGCCGAGCAGGCCACCCA
 GGAGGTGAAGGCTGGATGACCGACACCTTGTGTGCAGAACGCCAACCCGACTGCAAGACCATCTGAAGGCCCTGGGCCCGGCGCCA
 CCTGGAGGAGATGATGACCCCTGCCAGGGCGTGGCGGCCCGCCACAGGCCCGGTGCTGGCCGAGGCCATGTCCAGGTGACCAAC
 ACCACCGTGTGATGTCAGAACTCAACTCAAGGCCAGCGCCGATCGTGAAGTCTCACTGCGCAAGGAGGCCACATCGCCCAAGAA
 CTGCCGCGCCCCCGAAGAGGCTGTGGAAGTCCGCGCGGAGGGCCACCCAGATGAAGACTGCAACGAGCGCCAGGCCAATTCTCTGG
 GCAAGATCTGGCCCTTCCAACAAGGGCGGCCCGGCAACTTCTGCAAGAACCGCCCCGAGCCACCGCCCCGAGTCTTCTGGCTTC
 GCGAGGAGATCACCCCTCCCCCAAGCAGGAGCAGAGGAGGCGCTGTACCCCCCCCCCTGGCCTCCCTGAAGTCCCTGTTCGGCAACGA
 CCCCTAA

Fig. 84A

25. 2003 CON 14 BG gag. PEP
M GARASVLGGKLD AWEKIRLRPGGKKKYRMKHLVWASRELERFALNPDLLETAEGCQIMGQLQPALQTGTTEEIRSLFNTVATLYCVHQKI
EVKDTKEALEEVEKAQKKSQKQQAAMDEGNNSQASQNYPIVQNAQQQMVHQAI SPRTLNAWVKVVEEKAESPEVIMFSALSEGATPQDNLN
TMLNTVGGHQAAMQMLKDTINEEAAEWD RMHPQQAGPIPPGQIREPRGSDIAGTTSTLQEQIRWMTSNPPIPVGEIYKRWIILGLNKIVRMY
SPVSI LDIRQGPKEPFRDYVDFEFTLRAEQATQEVKGWMTDTLLVQANANPDCKTILRALGPGATLEEMMTACQGVGPGPSHKARVLAEAMSQ
ASGATIMMQKSNFKGPRRNKICFNCNGKEGHLARNCRAPRKKGCWKCGKEGHQMKDCTESKANFLGKIWPSNKGPRPGNFQLQNRPEPTAPPAES
FGFGEIEIAPSPKQEPKEKEIYPLASLKSFLGSDP\$SQ\$

Fig. 84B

2003 CON 14 BG gag. OPT.

ATATGGCGCGCGCCCTCCGTGCTGTCCGGCGGCAAGCTGGACGCGCTGGGAGAAAGATCCGCCTTGGCCCTCGCGCGGCAAGAAAGTACCGCAT
GAAGCAACCTGGTGTGGGCTCCCGAGCTGGAGCGCTTGCCTTGAACCCCGACCTGCTGGAGACCGCGAGGCTGCCAGCAGATCATGG
GCCAGCTGAGCCCGCCCTGACAGACCGGACCGAGGAGATCCGCTCCCTGTTCAACACCGTGGCCACCTGTACTGCTGCACCAAGAAGATC
GAGGTGAAGGACACCAAGGAGGCCCTGGAGAGGTGGAGAAGGCCCAAGAAGTCCAGAGAAGCAGAGGCCCATGGACCGCCATGGACCGGCAA
CAACTCCCAGGCTCCAGAACTACCCATCGTGCAAGACGCCAGGCCAGATGGTGACCAAGGCCATTCCTCCCGCACCTTGAACGCCT
GGGTGAAGTGGTGGAGGAGAAGCCTTCTCCCCGAGGTGATCCCCATGTTCTCCGCCCTGTCCGAGGGCGCCACCCCCAGGACCTGAAC
ACCATGCTGAACACCGTGGCGGCCACCAAGCGCCATGCAGATGCTGAAGGACACCATCAACGAGGAGGCCCGCGAGTGGGACCGCATGCA
CCCCAGAGGCGGCCCATCCCCCGGCAGATCCGGAGCCCCCGGCTCCGACATCGCGGCACACCTCCACCTGCAGGAGCAGA
TCGCTGGATGACCTCAACCCCCCATCCCCGTGGCGAGATCTACAAGCGCTGGATCATCCTGGGCTTGAACAAGATCGTGGCATGTAC
TCCCCGTGTCATCTGGACATCCGCCAGGCCCCAAGGAGCCCTCCGCGACTACGTGGAACCGCTTCTTCAAGACCTCGCGCCCTGGGCC
GGCAACCAAGAGGTGAAGGCTGGATGACCGACACCCCTGCTGTGCAGAACGCCAACCCCGACTGCAAGACCATCTCGCGCCCTGGGCC
CGGCGCCACCTGGAGGAGATGATGACCGCTGCCAGGGCGTGGCGGCCCTCCACAAAGCCCGCTGCTGCCGAGGCCATGTCCACG
GCTCCGGCGCCACCATCATGATGCAGAAGTCCAACCTCAAGGGCCCCCGCGCAACATCAAGTGCTTCAACTGCGGCAAGGAGGCCACCT
GGCCGCAACTGCCCGGCCCCCCGGAAGAAGGCTGCTGGAAGTGGGCAAGGAGGCCACCAAGATGAAGGACTGCACCGAGTCCAAGGCCA
ACTTCTGGGCAAGATCTGGCCCTCCAACAAGGGCGGCCCGGCAACTTCTGCAGAACGCCCGAGCCACCGCCCCCCCCCGGAGTCC
TTCGGCTTCGGCGAGGAGATCGCCCCCTCCCCCAAGCAGGAGCCCAGGAGAGATCTACCCCCCTGGCCTCCCTGAAGTCCCTGTTCGG
CTCCGACCCCTAATCCCAAGTAA

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Fig. 85A

31. 2003 CONS nef.PEP

MGGKWSKSSIVGWPAVRERIRRTTPAAEGVAVSQDLDKHAITSSNTAATNADCAWLEAQEEEEVGFVPRQVPLRPMTYKGAFDLSHFLK
 EKGGLDGLIYSKKRQEIILDLWVYHTQGYFFPDWQNYTPGPIRYPLTFGWCFLVPVDPEEVEEANEENNCILLHPMCQHGMEDEREVLMMWK
 FDSRLALRHIARELHPEFYKDC\$

Fig. 85B

2003 CONS nef.OPT

ATGGCGGCAAGTGGTCCAAGTCCTCCATCGTGGGCTGGCCCGCCGTGCGCGAGCGCATCCGCGCGACCCCGCCCGCGAGGGCGGTGGG
 CGCCGTGTCCAGGACCTGGACAGCACGGGCCATCACCTCCTCCAACACCGCGCCACCAAGCCGACTGCGCCTGGCTGGAGGCCCAGG
 AGGAGGAGGAGTGGGCTTCCCGTGGCCCGCCAGGTGCCCTGCGGCCCATGACCTACAAGGGCGCCTTGGACCTGTCCACTTCCCTGAAG
 GAGAAGGGCGGCTGGACGGCCTGATCTACTCCAAGAAAGCGCCAGGAGATCCTGGACCTGTGGGTGTACCAACCCAGGGCTACTTCCCCGA
 CTGGCAGAACTACACCCCGGCCCGGCATCCGCTACCCCTGACCTTCGGCTGGTGTCAAGCTGGTGGCCGTGGACCCCGAGGAGGTGG
 AGGAGGCCAACGAGGGCGAGAACAACTGCTGTGACCCCATGTGCCAGCACCGCATGGAGGACCGGAGGTGCTGATGTGGAAG
 TTCGACTCCCGCCTGGCCCTGCGCCACATCGCCCGGAGCTGCAACCCGAGTCTACAAGGACTGTAA

Fig. 86A

32. 2003 M. GROUP.anc nef.PEP

MGGKWSKSSIVGWPAVRERIRRTTPAAEGVAVSQDLDKHAITSSNTAATNADCAWLEAQEEEEVGFVPRQVPLRPMTYKAAFDLSHFLK
 EKGGLDGLIYSKKRQEIILDLWVYHTQGYFFPDWQNYTPGPIRYPLTFGWCFLVPVDPEEVEEANEENNCILLHPMCQHGMEDEREVLMMWK
 FDSRLALRHIARELHPEFYKDC\$

Fig. 86B

2003 M GROUP.anc nef.OPT

ATGGCGGCAAGTGGTCCAAGTCTCCATCGTGGGCTGGCCCGCCGTGCGCGAGCGCATGCGCGCACCCCGCCCGCGAGGGCGGTGGG
 CGCCGTGTCCAGGACCTGGACAGCACGGGCCATCACCTCCTCCAACACCGCGCCACCAAGCCGACTGCGCCTGGCTGGAGGCCCAGG
 AGGAGGAGGAGTGGGCTTCCCGTGGCCCGCCAGGTGCCCTGCGGCCCATGACCTACAAGGGCGCCTTGCACCTGTCCCACTTCCCTGAAG
 GAGAAGGGCGGCTGGACGGCCTGATCTACTCCAAGAAAGCGCCAGGAGATCCTGGACCTGTGGGTGTACCAACCCAGGGCTACTTCCCCGA
 CTGGCAGAACTACACCCCGGCCCGGCATCCGCTACCCCTGACCTTCGGCTGGTGTCAAGCTGGTGGCCGTGGACCCCGAGGAGGTGG
 AGGAGGCCAACGAGGGCGAGAACAACTGCTGTGACCCCATGTGCCAGCACCGCATGGAGGACCGGAGGTGCTGATGTGGAAG
 TTCGACTCCCGCCTGGCCCTGCGCCACATCGCCCGGAGCTGCAACCCGAGTCTACAAGGACTGTAA

Fig. 90A

37. 2003 CON B nef. PEP
 MGKWSKR^{SV}VGWPTVRERMRAEPAADGVGAVSRDLEKHGAI^{TSSNTA}ANNADCAWLEAQEEEEVGFVPRQVPLRPM^{TY}KGALDLSHFLK
 EKGGLEGLIYSQKRQDILD^{LVYHTQGYFPD}WQNYTPGPGIRYPLTFGWC^{FKLVPVEPEKVEE}ANEGENN^{SLLHPMSLHGMD}DDPEREVLVWK
 FDSRLAFHHMARELHPEYKDC\$

Fig. 90B

2003 CON-B nef. OPT
 ATGGCGGCAAGTGTCCAAGCGCTCCGTGGTGGGCTGGCCACCGGTGCGGAGCGCATGCGCGCGCGAGCCCGCGACGGCGTGGG
 CGCCGTGTCCCGGACCTGGAGACACGGCGCCATCACCTCTCCAACACCGCGCCAACAACGCGGACTGCGCCTGGCTGGAGGCCCAGG
 AGGAGGAGGAGGTGGGCTTCCCGTGGCCCGCCAGGTGCGCCCATGACCTACAAAGGCGCCCTGGACCTGTCCCACTTCCTGAAG
 GAGAAAGGCGGCGCTGGAGGGCTGATCTACTCCAGAGCGCCAGGACATCCTGGACCTGTGGGTGTACCAACCCAGGGCTACTTCCCCGA
 CTGGCAGAACTACACCCCGGCGCATCCGCTACCCCTGACCTTCGGTGGTGTCAAGCTGGTGGCCCGTGGAGCCCGAGAGGTGG
 AGGAGGCCAACGAGGGCGAGAACAACTCCCTGTGCACCCCATGTCCCTGCACGGCATGGACGACCCCGAGCGGAGGTGCTGTGTGAAG
 TTCGACTCCCGCCTGGCCTTCCACCACATGGCCCGGAGCTGCACCCCGAGTACTACAAGGACTGTAA

Fig. 90C

38. 2003 B.anc nef. PEP
 MGKWSKSSMGWPAVRERMKRAEPAADGVGAVSRDLEKHGAI^{TSSNTA}ATNADCAWLEAQEEEEVGFVPRQVPLRPM^{TY}KAALDLSHFLK
 EKGGLEGLIYSQKRQDILD^{LVYHTQGYFPD}WQNYTPGPGIRYPLTFGWC^{FKLVPVEPEKVEE}ATEGENN^{SLLHPMCQHGM}DDPEKEVLVWK
 FDSRLAFHHMARELHPEYKDC\$

Fig. 90D

2003 B.anc nef. OPT
 ATGGCGGCAAGTGTCCAAGTCTCCATGGGCGGCTGGCCCGCGGTGCGGAGCGCATGAAGCGCGCGAGCCCGCGACGGCGTGGG
 CGCCGTGTCCCGGACCTGGAGAGCACGGCGCCATCACCTCTCCAACACCGCGCCACCAACGCGGACTGCGCCTGGCTGGAGGCCCAGG
 AGGAGGAGGAGGTGGGCTTCCCGTGGCCCGCCAGGTGCGCCCATGACCTACAAAGCGCGCCCTGGACCTGTCCCACTTCCTGAAG
 GAGAAGGCGGCGCTGGAGGGCTGATCTACTCCAGAAAGCGCCAGGACATCCTGGACCTGTGGGTGTACCAACCCAGGGCTACTTCCCCGA
 CTGGCAGAACTACACCCCGGCGCATCCGCTACCCCTGACCTTCGGTGGTGTCAAGCTGGTGGCCCGTGGAGCCCGAGAGGTGG
 AGGAGGCCACCGAGGGCGAGAACAACTCCCTGTGTCAACCCCATGTGCCAGCACGGCATGGACGACCCCGAGAGGAGGTGCTGTGTGAAG
 TTCGACTCCCGCCTGGCCTTCCACCACATGGCCCGGAGCTGCACCCCGAGTACTACAAGGACTGTAA

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Fig. 91A

39. 2003 CON 02 AG nef. PEP
 MGGKWSKSSIVGPKVRIRIQTTPPAATGVGAASQDLDRHGAI TSSNTAATNADCAWLEAQEEEEVGFVRPQVPLRPMTYKAAVDLSHFLK
 EKGGLEGLIYSKKRQEI LDWVYHTQGFPPDWQNYTPGPTREFPLTFGWCFLVPMDPAEVEEANEGENNSLLHPICQHGMEDREVLVWR
 FDSSLAFKHRARELHPEFYKDC\$

Fig. 91B

2003 CON 02 AG nef. OPT
 ATGGCGGCAAGTGGTCCAAAGTCCTCCATCGTGGGCTGGCCCAAGGTGCGGAGCGCATCGCCAGACCCCGCCCGCCACCGGCGTGGG
 CGCCGCTCCAGGACCTGGACCGCCACGGCGCCATCACCTCTCAACACCGCCGCCACCAACGCCGACTGCGCCTGGCTGGAGGCCCAGG
 AGGAGGAGGAGTGGCTTCCCGTGGCGCCCGAGGTGCGCCCATGACCTACAAGCCGCGTGGACCTGTCCACTTCCCTGAAG
 GAGAGGGCGGCTGGAGGCGCTGATCTACTCCAAGAAGCGCCAGGAGATCCTGGACCTGTGGGTGTACACACCCAGGCTTCTTCCCCGA
 CTGGCAGAACTACACCCCGGCGCCCGGACCCGCTTCCCGCTGACCTTCGGCTGGTGTTCAGCTGGTGCCTATGGACCCCGCGAGGTGG
 AGGAGGCCAACGAGGGCGAGAACAACTCCCTGTGTCACCCCATCTGCCAGCACGGCATGGAGGACGAGGACCGCGAGGTGTGTGGCGC
 TTCGACTCCTCCCTGGCCTTCAAGCACCGCGCGGAGCTGCACCCCGAGTTCTACAGGACTGCTAA

Fig. 92A

40. 2003 CON C nef. PEP
 MGGKWSKSSIVGWPVAVRERIRRTPEAAEGVGAASQDLDKHGALTSSNTATNADCAWLEAQEEEEVGFVRPQVPLRPMTYKAAFDLSFFL
 KEKGGLEGLIYSKKRQEI LDWVYHTQGYFPDQNYTPGPGVRYPLTFGWCFLVPVDPREVEEANEGENNCLLHPMSQHGMEDREVLKW
 KFDShLARRHARELHPEYKDC\$

Fig. 92B

2003 CON C nef. OPT
 ATGGCGGCAAGTGGTCCAAAGTCCTCCATCGTGGGCTGGCCCGCGGTGCGGAGCGCATCCGCCCGCACCGAGCCCGCCCGAGGGCGTGGG
 CGCCGCTCCAGGACCTGGACAAGCAGCGCCCTGACCTCTCAACACCGCCACCAACACGCCGACTGCGCCTGGCTGGAGGCCCAGG
 AGGAGGAGGAGTGGCTTCCCGTGGCGCCCGAGGTGCCCTGGCGCCCATGACCTACAAGCCGCTTCGACCTGTCCCTTCTCCCTG
 AAGGAGAAGGGCGGCTGGAGGCGCTGATCTACTCCAAGAAAGCGCAGGAGATCCTGGACCTGTGGGTGTACCAACCCAGGGCTACTCCC
 CGACTGGCAGAACTACACCCCGGCGTGGCTACCCCTGACCTTCGGCTGGTGTTCAGCTGGTGGCCGTGGACCCCGCGAGG
 TGGAGGAGGCCAACGAGGGCGAGAACAACTGCTGTGCACCCCATGTCCAGCACGGCATGGAGGACGAGGACCGCGAGGTGCTGAAGTGG
 AAGTTCGACTCCCACTGGCCCGCGGCACATGGCCCGCGAGCTGCACCCCGAGTACTACAAGGACTGCTAA

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Fig. 92C

41. 2003 C.anc nef.PEP

MGKWSKSSIVGWPAVRERMRRTTEPAAGVGAAASQDLDKHGALTSNTAANNADCAWLEAQEEEEEVGFVPRPQVPLRPMTYKAADFDSFFL
KEKGGLDGLIYSKKRQEIILDLWVYHTQGYFPDWQNYTPGPGVRYPLTFGWCFKLVPDPREVEEANEENCLLHPMSQHGMEDREVLKW
KFDSLARRHMARELHPEYKDC\$

Fig. 92D

2003 C.anc nef.OPT

ATGGCGGCAAGTGGTCCAAGTCCTCCATCGTGGGCTGGCCGCGGTGCGGAGCGCATGCGCGCACCGAGCCCGCGCGGCGGTGGG
CGCCGCTCCAGGACCTGGACAGCAGCGGCTGACCTCCTCAACACCGCGCCCAACACGCGGACTGCGCTGGCTGGAGGCCAGG
AGGAGGAGGAGGTGGGCTTCCCGTGGCGCCCGCAGGTGCGGCTGCGGAGGATGACCTACAGGCGGCTTGCACCTGCTCTTCTCTG
AAGGAGAAAGGCGGCTGGACGGCTGATCTACTCAAGAAGCGCAGGAGATCCTGGACCTGTGGGTGTACACACCCAGGGCTACTTCCC
CGACTGGCAGAACTACACCCCGCGGCGTGGCTACCCCTGACCTTCGGCTGGTGTCAAGCTGGTGGACCCCGCGGAGG
TGGAGGAGGCCAACGAGGCGGAGAACAACTGCCTGCTGACACCCCATGTCCAGCACGGCATGGAGGACGAGCACCGCGAGGTGCTGAAGTGG
AAGTTCGACTCCACCTGGCCCGCGGCGCACATGGCCCGGAGCTGACCCCGAGTACTACAAGGACTGCTAA

Fig. 93A

42. 2003 CON D nef.PEP

MGKWSKSSIVGWPAIRERIRRTTEPAADGVGAVSRDLEKHGAISSNTAATNADCAWLEAQEEDEEVGFVPRPQVPLRPMTYKAALDLSHFL
KEKGGLEGLVWSQKRQEIILDLWVYNTQGFPPDWQNYTPGPGIRYPLTFGWCFELVPDPEEVEEATEGENNCLLHPMCQHGMEDPEREVLWW
RFNSRLAFEHKARVLHPEFYKDC\$

Fig. 93B

2003 CON D nef.OPT

ATGGCGGCAAGTGGTCCAAGTCCTCCATCGTGGGCTGGCCCGCATCCGCGAGCGCATCCGCGCACCGAGCCCGCGCGGCGGTGGG
CGCCGTGTCCCGGACCTGGAGAGCAGCGGCTACCTCCTCAACACCGCGCCCAACGCGGACTGCGCTGGCTGGAGGCCAGG
AGGAGGACGAGGAGGTGGGCTTCCCGTGGCGCCCGCAGGTGCGGCTGCGGAGGATGACCTACAGGCGGCTGGACCTGTCCACTTCCCTG
AAGGAGAAAGGCGGCTGGAGGCGCTGGTGTGTCAGAGCGCAGGAGATCCTGGACCTGTGGGTGTACACACCCAGGGCTTCTTCCC
CGACTGGCAGAACTACACCCCGCGGCGTCCGTCAGCTACCCCTGACCTTCGGCTGGTGTTCGAGCTGGTGGACCCCGGAGGAGG
TGGAGGAGGCCACCGAGGCGGAGAACAACTGCCTGCTGACACCCCATGTGCCAGCACGGCATGGAGGACCCCGAGCGGAGGTGCTGATGTGG
CGCTTCAACTCCCGCTGGCCTTCGAGCACAGGCCCGCGTGTGACCCCGAGTCTACAAGGACTGCTAA

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Fig. 94A

43. 2003 CON F1 nef. PEP

MGGKWSKSSIVG^WPAVRERMRPTPPAAEGVGAVSQDLIERGAI TSSNTGATNPDLAWLEAQEEEEVGFVPRQVPLRPMTYKGAVDLSHFLK
 EKGGLEGLIYSKKRQEI^LDLWVYHTQGYFFPDWQNYTPGPGIRYPLTFGWCFKLVPVDPEEVEKANEGENNC^LLLHPMSQHGMEDREVLWK
 FDSRLALRHIARERHPEFYQDS

Fig. 94B

2003 CON F1 nef. OPT

ATGGCGGCAAGTGGTCCAGTCTCCATCGTGGGTGGCCGCGGTGGCGAGGCGATGCGCCCAACCCCGCGCGGCGGTGGG
 CGCCGTGTCCCAGGACCTGGAGCGCGGCGCATCACTCTCCAACACCGGGCCACCAACCCGACCTGGCCTGGCTGGAGGCCCAGG
 AGGAGGAGGAGGTGGGCTTCCCGTGGCGCCCGAGGTGCGCCCATGACCTACAAGGGCGCGGTGGACCTGTCCCACTTCCCTGAAG
 GAGAAGGGCGGCTGGAGGGCTGATCTACTCCAAGAAAGCGCCAGGAGATCCTGGACCTGTGGGTGTACACACCCAGGGCTACTTCCCCGA
 CTGGCAGAACTACACCCCGGCGCATCCGCTACCCCTGACCTTCGGCTGGTCTTCAAGCTGGTCCCCGTGGACCCCGAGGAGGTGG
 AGAAGGCCAACGAGGGCGAGAACACTGCTGTCACCCCATGTCCAGCACGGCATGGAGGACCGCGAGGTGCTGATCTGGAAG
 TTCGACTCCCGCTGGCCCTGCGCCACATCGCCCGGAGCGCCACCCCGAGTCTACCAAGGACTAA

Fig. 95A

44. 2003 CON F2 nef. PEP

MGGKWSKSSIVG^WPTIRERIRRTPVAAEGVGAVSQDLKDHGAI TSSNTRATNADLAWLEAQEDEEVGFVPRQVPLRPMTYKAAFDLSHFLK
 EKGGLEGLIYSKKRQEI^LDLWVYHTQGYFFPDWQNYTPGPGTRYPLTFGWCFKLVPVDPEEVEKANEGENNC^LLLHPMSLHGMEDREVLKWK
 FDSRLALRHIARERHPEYKDS

Fig. 95B

2003 CON F2 nef. OPT

ATGGCGGCAAGTGGTCCAGTCTCCATCGTGGGTGGCCCAACCATCCGGAGCGCATCCGCGCACCCCGCGCGGCGGTGGG
 CGCCGTGTCCCAGGACCTGGACAAGCAGCGGCGCATCACCTCTCCAACACCGCGCCACCAACGCGACCTGGCCTGGCTGGAGGCCCAGG
 AGGACGAGGAGGTGGGCTTCCCGTGGCGCCCGAGGTGCGCCCATGACCTACAAGGGCGCGCTTGGACCTGTCCCACTTCCCTGAAG
 GAGAAGGGCGGCTGGAGGGCTGATCTACTCCAAGAAAGCGCCAGGAGATCCTGGACCTGTGGGTGTACACACCCAGGGCTACTTCCCCGA
 CTGGCAGAACTACACCCCGGCGCACCCGCTACCCCTGACCTTCGGCTGGTCTTCAAGCTGGTCCCCGTGGACCCCGAGGAGGTGG
 AGAAGGCCAACGAGGGCGAGAACACTGCTGTCACCCCATGTCCCTGCACGGCATGGAGGACCGCGAGGTGCTGAAGTGGGAAG
 TTCGACTCCCGCTGGCCCTGCGCCACATCGCCCGGAGCGCCACCCCGAGTACTACAAGGACTAA

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Fig. 96A

45. 2003 CON G nef.PEP
 MGKWSKSSIVGWPEVRERIRQTPAAEGVAVSQDLARHGAISSNTAANNPDCAWLEAQEEDSEVGFVRPQVPLRPMTYKGAFDLSFFL
 KEKGGDLGLIYSKKRQDILDWVYNTQGFEPDWQNYTPGPGTRFPLTFGWCFKLVPMDPAEVEEANKGENNSLLHPIQHGMEDEEREVLVW
 RFDSSLARRHIARELHPEYKDC\$

Fig. 96B

2003 CON G nef.OPT
 ATGGCGGCAAGTGGTCCAAAGTCCATCGTGGGTGGCCGAGGTGCGGAGCGGCATCCGCCAGACCCCGCCGCGCCGAGGGCGGTGGG
 CGCCGTGTCCAGGACCTGGCCGCGCCACCTCCACACACGCGCCCAACAACCCGACTGCGCTGGCTGGAGGCCCAGG
 AGGAGGACTCCGAGGTGGCTTCCCGTGGCCCGCCAGGTGCCCCATGACCTACAAGGGCGCTTCGACCTGTCTTCTCCTG
 AAGGAGAAGGGCGGCTGGACGGCTGATCTACTCAAGAAAGCGCAGACATCCTGGACCTGTGGGTGTACAACACCCAGGGCTTCTTCCC
 CGACTGGCAGAACTACACCCCGGCGCCGACCCGCTTCCCGCTGACCTTCGGCTGGTGTCAAGTGGTGCCCATGGACCCCGCCGAGG
 TGGAGGAGGCCAACAGGGCGAGAACACTCCCTGTGACCCCATCTGCCAGCACGGCATGGAGGACGAGGACCGGAGGTGCTGTGTGG
 CGTTCGACTCCTCCTGGCCCGCCGACATCGCCCGGAGCTGCACCCGAGTACTACAAGGACTGCTAA

Fig. 97A

46. 2003 CON H nef.PEP
 MGKWSKSSIGGWPAIRERIRRAEPAAEGVAVSRDLDRRGAVTINNASTNPDSAMLEAQEEEEVEVGFVRPQVPLRPMTYKGAFDLSHFL
 KEKGGLEGLIYSKKRQEIILWVYNTQGYFPDWQNYTPGPGERYPLTFGWCFKLVDPDQVEVEKANEGENNSLLHPIQHGMEDEEREVLW
 KFDSRLAFRHHIARELHPEFYKDC\$

Fig. 97B

2003 CON H nef.OPT
 ATGGCGGCAAGTGGTCCAAAGTCCATCGGCGGTGGCCCGCATCCGGGAGCGGCATCCGCCGCGCGGAGCCCGCGGCGGTGGG
 CGCCGTGTCCCGGACCTGGACCGCGGCGCGTGACCATCAACAACACCGCTCCACCAACCCCGACTCCGCTGGCTGGAGGCCCAGG
 AGGAGGAGGAGGTGGCTTCCCGTGGCCCGCCAGGTGCCCTGGCGCCCATGACCTACAAGGGCGCTTCGACCTGTCCCACTTCCCTG
 AAGGAGAAGGGCGGCTGGAGGGCTGATCTACTCAAGAAAGCGCAGGAGATCCTGGACCTGTGGGTGTACAACACCCAGGGCTACTTCCC
 CGACTGGCAGAACTACACCCCGGCGGAGCGCTACCCCTGACCTTCGGTGGTGTCAAGTGTGCCCCGTGGACCCCGAGGAGG
 TGGAGAAGGCCAACGAGGGCGAGAACACTCCCTGTGACCCCATCTGCCAGCACGGCATGGAGGACGAGGAGCGGAGGTGCTGATGTGG
 AAGTTCGACTCCCGCTGGCCCTTCCGCCACATCGCCCGGAGCTGCACCCGAGTCTACAAGGACTGCTAA

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Fig. 98A

47. 2003 CON 01 AE nef. PEP
 MGGKWSKSSIVGWPQVRERIKQTPPATEGVAVSQDLDKHGAVTSSNMNADCVLRAQEEEEVGFPVRPQVPLRPMTYKGAFDLSFFLKEK
 GGLDGLIYSKKRQEIILDLWYNTQGFPPDWQNYTPGPGIRYPLCFGWCFKLVDPDPREVEEDNKGENNCLLHPMSQHIGIEDEEREVEVLMWKFD
 SALARKHIARELHPEYKDC\$

Fig. 98B

2003 CON 01 AE nef. OPT
 ATGGCGGCAAGTGGTCCCAAGTCCATCGTGGGCTGGCCCCAGGTGGCGAGCGCATCAAGCAGACCCCCCGCCACCGAGGGCGGTGGG
 CGCCGTGTCCAGGACCTGGACAGCAGCGCGCGTGACCTCTCAACATGAACAACGCCGACTGCGTGTGGCTGCGCGCCAGGAGGAGG
 AGGAGGTGGGCTTCCCCGTGCGCCCCAGGTGCCCCCATGACCTAACAGGGCGCCTTCGACCTGTCTCTTCTCTGAAGGAGAAG
 GCGGCGCTGGACGGCCTGATCTACTCAAGAGCGCAGAGATCCTGGACCTGTGGGTGTACAACACCCAGGGCTTCTTCCCCGACTGGCA
 GAATAACCCCCGGCCCCGCGCATCCGCTACCCCTGTGCTTCCGCTTCAAGCTGGTGGCGGAGCCCCGCGAGGTGGAGGAGG
 ACAACAAGGGCGAGAACAACTGCCTGTGCACCCCATGTCCAGCAGCGCATCGAGGACGAGGCGGAGGTGCTGATGTGGAAGTTCGAC
 TCCGCCCTGGCCCCGCAAGCACATCGCCCCGAGCTGCACCCCGAGTACTACAAGGACTGCTAA

Fig. 99A

48. 2003 CON 03 AE nef. PEP
 MGGKWSKSSIVGWPQVRERIRRAPAPARGVPSQDLDKYGAVTSSNTAANNADCAWLEAQKEEEVGFPVRPQVPLRPMTYKGAFDLSHFL
 KEKGLDGLIYSKKRQEIILDLWYHTQGYFPDWQNYTPGPGIRFPLTFGWICYKLVDPDPDEVEEATEGENNSLLHPICQHGMDDEEKEVLMW
 KFDSRLALTHRARELHPEFYKDC\$

Fig. 99B

2003 CON 03 AE nef. OPT
 ATGGCGGCAAGTGGTCCCAAGTCCATCGTGGGCTGGCCCCAGGTGGCGAGCGCATCCGCCGCCGCCGCCGCCGCCGCCGCCGCCGCCGCCG
 GGGCCCCGTGTCCAGGACCTGGACAAAGTACGGGCGCGTGACCTCTCAACACCGCCGCAACACCGCCGACTGCGCCTGGCTGGAGGCCCC
 AGAAGGAGGAGGAGGTGGGCTTCCCCGTGCGCCCCAGGTGCCCCCTGCGCCCATGACCTACAAGGGCGCCTTCGACCTGTCCCACTTCCCTG
 AAGGAGAAGGGCGGCGCTGACCTACTCAAGAAAGCGCAGGAGATCCTGGACCTGTGGGTGTACCAACCCAGGGCTACTTCCC
 CGACTGGCAGAACTACACCCCGGCCATCCGCTTCCCCCTGACCTTCCGCTGGTGTACAAGCTGGTGGCGGACCCCGGACCCCGACGAGG
 TGGAGGAGGCCACCGAGGGCGAGAACAACTCCCTGTGTCACCCCATCTGCCAGCACCGCATGGACGAGGAGGAGGAGGTGCTGATGTGG
 AAGTTCGACTCCCCGCTGGCCCCGAGCTGCACCCCGAGTTCTACAAGGACTGCTAA

Fig. 100A

49. 2003 CON 04 CFX nef.PEP
 MGKWSKSSIVGPAIRERMRQRPQAEPAAAGVAVSQDLDKHGAISSNTAATNPDKAWLEAQEEEEVEGFPVRPQVPLRPMTFKAALD
 LSHFLKEKGGDLGLIYSKKRQEIILDLWVYHTQGYFPDQWNYTPGGERFPLCFGWCFKLVVDPPQVEVEATEGENNCLLHPISQHGMEDEER
 EVLKWKFDSSLAYKXHIARELHPEFYKDC\$

Fig. 100B

2003 CON 04 CFX nef.OPT
 ATGGCGGCAAGTGGTCCAGTCCTCCATCGTGGGCTGGCCGCCCATCCGGAGGCGATGCGCCAGCGGGCCCCAGGCCGAGCCCGC
 CGCCCGCGCGTGGCGCGGTGTCCAGGACCTGGACAAGCAGCGGCCATCACCTCTCCAAACCGCCGCCAACCCGACAAAGGCCT
 GGCTGGAGGCCAGGAGGAGGAGGTGGGCTTCCCGTGGCCCGCCAGGTGCCCCATGACCTTAAAGGCCGCCCTGGAC
 CTGTCCCACTTCTGAAGGAGAGGGCGCTGGACGGCCTGATCTACTCCAAGAAAGCGCCAGGAGATCCTGGACCTGTGGGTGTACAACAC
 CCAGGGCTACTTCCCGACTGGCAGAACTACACCCCGCGCGAGCGCTTCCCGCTGTGCTTCCGCTTCAAGCTGGTGGCCG
 TGGACCCCGAGGAGTGGAGGAGGCCACCGAGGGCGAGAACAACTGCCTGTGCACCCCATCTCCAGCACGGCATGGAGGACGAGGAGCGC
 GAGGTGCTGAAGTGAAGTTCGACTCCCGCTTACAAAGCACATGCGCCGCGAGCTGCACCCCGAGTTCTACAAGGACTGCTAA

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Fig. 101A

50. 2003 CON 06 CFX nef.PEP
 MGKWSKSSIVGWPQVRERMRNPTEGAAGVAVSQDLDKHGAISSNTATTNAACAWLEAQTEDEVGFPVRPQVPLRPMTYKGAFDLSFF
 LKEKGGDLGLIYSKKRQEIILDLWVYHTQGFPPDQWNYTPGPGIRYPLTFGWICYKLVVDPKVEEEDTKGENNCLLHPMCQHGVEDEEREVL
 WKFDSSLARRHIAREMHPEFYKDC\$

Fig. 101B

2003 CON 06 CFX nef.OPT
 ATGGCGGCAAGTGGTCCAGTCCTCCATCGTGGGCTGGCCCGAGGTGCGCGAGGCGATGCGCAACCCCGCCAGGGCGCCCGGAGGG
 CGTGGCGCGCGTGTCCAGGACCTGGACAAGCAGCGGCCATCACCTCTCCAACACCGCCACCAACCGCCCTGCGCTGGCTGGAGG
 CCCAGACCGAGGACGAGTGGCTTCCCGTGGCGCCCGAGGTGCCCCCTGCGCCCATGACCTACAAGGGCGCCTTCGACCTGTCTTCTTC
 CTGAAGGAGAGGGCGGCTGACCGGCTGATCTACTCCAAGAAGCGCCAGGAGATCCTGGACCTGTGGGTGTACACACCCAGGGCTTCTT
 CCCCAGTGGCAGAACTACACCCCGCGCGCATCCGCTACCCCTGACCTTCCGCTGGTGTACAGCTGGTGGCCCGTGGACCCCAAGG
 AGGTGGAGGACACCAAGGCGGAGAACAACTGCCTGTGCACCCCATGTGCCAGCAGCGGTGGAGGACGAGGAGCGGAGGTGCTGATG
 TGGAGTTGCACTCCTCCCTGGCCCGCGGACATCGCCCGCGAGATGCACCCCGAGTTCTACAAGGACTGCTAA

Fig. 102A

51. 2003 CON 08 BC nef.PEP
 MGKWSKSSIVG $\overline{\text{WPA}}$ IRRI $\overline{\text{RTE}}$ PAADGVGAVSRDLEKHGAITSSNTADTNADCAWLETQEEEEVGFVPRPQVPLRPM $\overline{\text{TFK}}$ GALDLSFFLK
 EKGGLEGLIYSKKRQELDLWVYHTQGYFPDWHNYTPGPGVRFPLTFGWCFLVPVDPREVEEANEGEDNCLLHPVCQHMEDEHREVLKWK
 FDSQLAHRHRELHPEFYKDC \S

Fig. 102B

2003 CON 08 BC nef.OPT
 ATGGCGGCAAGTGGTCCAAAGTCTCCATCGTGGGCTGGCCCGCCATCCGCGAGCGCATCCGCCGACCGAGCCCGCCGACGGCGTGGG
 CGCCGTGTCCCGGACCTGGAGAGCACGGGCCATCACTCTCAACACCGCCGACACCAACGCCGACTGGCCTGGCTGGAGACCCAGG
 AGGAGGAGGAGTGGCTTCCCGTGGCCCGCCAGGTGCCCTGCGCCCATGACCTTCAAGGGCGCCCTGGACCTGTCTTCTTCTGAAG
 GAGAAGGGCGCCTGGAGGCTGATCTACTCAAGAAGCGCCAGGAGATCCTGGACCTGTGGGTGTACACACCCAGGGCTACTTCCCCGA
 CTGGCACAATAACACCCCGGCCCGCGCTTCCCTGACCTTCGGCTGGTGTCAAGCTGGTGGCCCGTGGACCCCGCGAGGTGG
 AGGAGGCCAACGAGGGCGAGGACAATGCTGCTGCAACCCCGTGTCCAGCACGGCATGGAGGACCGCGAGGTGCTGAAGTGGAAAG
 TTCGACTCCAGCTGGCCCAACCGCCACCGCGAGCTGACCCCGAGTCTACAAGGACTGCTAA

Fig. 103A

52. 2003 CON 10 CD nef.PEP
 MGKWSKSSIVG $\overline{\text{WPA}}$ VRIRRTDPA $\overline{\text{AEGV}}$ GAASRDLEKYGAITSSNTAQTNPDCAWLEAQEEEEVGFVPRPQVPLRPM $\overline{\text{TYK}}$ GAFDLSFFL
 KEKGGLEGLIYSKRRQDILDLWVYNTQGFPPDWNQYTPGPGIRYPLTFGWCYKLVVPDPREVEEANEGENNSLLHPMSLHGMEDPHGEVLMW
 KFDSNLAHKHMARELHPEYKDC \S

Fig. 103B

2003 CON 10 CD nef.OPT
 ATGGCGGCAAGTGGTCCAAAGTCTCCATCGTGGGCTGGCCCGCCGTCGCGGAGCGCATCCGCCGACCGACCCCGCCGAGGGCGTGGG
 CGCCGCTCCCGGACCTGGAGAGTACGGGCCATCACTCTCAACACCGCCAGACCAACCCGACTGGCCTGGCTGGAGGCCCAGG
 AGGAGGAGGAGTGGCTTCCCGTGGCCCGCCAGGTGCCCTGCGCCCATGACCTACAAGGGCGCCTTCGACCTGTCTTCTTCTG
 AAGAGAAAGGGCGCCTGGAGGCTGATCTACTCAAGCGCCCGCAGGACATCCTGGACCTGTGGGTGTACAACACCCAGGGCTTCTTCCC
 CGACTGGCAGAACTACACCCCGCCGCGCATCCGCTACCCCTGACCTTCGGCTGGTGTACAAGCTGGTCCCGTGGACCCCGCGAGG
 TGGAGGAGGCCAACGAGGGCGAGAAC $\overline{\text{CACTCCCTGTGCA}}$ CCCCATGTCCCTGCACGGCATGGAGGACCCCAACGGCGAGGTGCTGATGTGG
 AAGTTCGACTCCAACCTGGCCCAACAGCACATGGCCCGCGAGCTGCACCCCGAGTACTACAAGGACTGCTAA

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Fig. 104A

53. 2003 CON 11 CFX nef .PEP

MGGKWSKSSIVG^WPEIRERLRRTPPTAAEGVGAVSKDLEKHGAVTSSNTAQTNAACAWLEAQEEEEVGFVVRPQVPLRPMTYKGAFDLGEFF
 LKEKGGLDGLIYSKKRQEIILDLWVYHTQGYFFPDWQNYTPGPIRYPLCFGWCFLVPVEPREVEEANEENNCLLHPMSQHGMDDEEREVLIM
 WKFDSSLARRHIARELHPDFYKDC\$

Fig. 104B

2003 CON 11 CFX nef .OPT

ATGGGCGGCAAGTGGTCCAAAGTCCCTCCATCGTGGGCTGGCCCGAGATCCGGGAGCGGCTGCGCCGCAACCCCGCCGCGCCGAGGG
 CGTGGGCGCCGTGTCCAGGACCTGGAGAACACGGGCGCGTGACCTCTCCAACACCGCCAGACCAACGCGCCTGGCTGGCTGGAGG
 CCCAGGAGGAGGAGGTGGCTTCCCGTGGCCCGCCAGGTGCCCCATGACCTACAAGGGCGCCTTCGACCTGGGCTTCTTC
 CTGAAGGAGAAAGGCGGCTTGACGGCTGATCTACTCAAGAAGCGCCAGGAGATCCTGGACCTGTGGGTGTACACACACCCAGGGCTACTT
 CCCCAGCTGGCAGAACTACACCCCGGCGCATCCGCTACCCCTGTGCTTCGGCTGGTCAAGCTGGTGGCCGCTGGAGCCCCCGG
 AGGTGGAGGAGGCCAACAGAGGGCGAGAACAACTGCCTGTGCACCCCATGTCCAGACGCGCATGGACGAGCGCGAGGTGCTGATG
 TGGAGTTCGACTCCTCCCTGGCCCGCCACATCGCCCGGAGCTGCACCCGACTTCTACAAGGACTGCTAA

Fig. 105A

54. 2003 CON 12 BF nef .PEP

MGGKWSKSSIVG^WPDIRERMRRAPPAEGVGAVSQDLENRGAITSSNTRANPNPDALWLEAQEEEEVGFVVRPQVPLRPMTYKGAFLDLSHFLK
 EKGGLLEGLIYSKKRQEIILDLWVYHTQGYFFPDWQNYTPGPIRYPLTFGWCFLVPDPEEVEKANEGENNCLLHPMSQHGMEDEDEVLMMWK
 FDSRLALRHIAREKHPEFYQDC\$

Fig. 105B

2003 CON 12 BF nef .OPT

ATGGGCGGCAAGTGGTCCAAAGTCCCTCCATCGTGGGCTGGCCCGACATCCGGGAGCGCATGCGCCGCGCCCGCCCGCCGCGCGGCGGTGGG
 CGCCGTGTCCAGGACCTGGAGAACCGGCGCGCATCACCCTCCAACACCGCGCCCAACACCCGACCTGGCTGGCTGGAGGCCAGG
 AGGAGGAGGAGGTGGCTTCCCGTGGCCCGCCAGGTGCCCCATGACCTACAAGGGCGCCTGGACCTGTCCCACCTTCTCTGAAG
 GAGAAGGGCGGCTGGAGGGCTGATCTACTCAAGAAGCGCCAGGAGATCCTGGACCTGTGGGTGTACACACCCAGGGCTACTTCCCCGA
 CTGGCAGAACTACACCCCGGCGCATCCGCTACCCCTGACCTTCGGCTGGTCTCAAGCTGGTGGCCGCTGGACCCCGAGGAGGTGG
 AGAAGGCCAACGAGGGCGAGAACAACTGCCTGTGCACCCCATGTCCAGCACGGCATGGAGGACCGCGAGGTGCTGATGTGGAAG
 TTCGACTCCCGCCTGGCCCTGCGCCACATCGCCCGGAGAACCCCGAGTTCTACCAAGGACTGCTAA

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Fig. 106A

55. 2003 CON 14 BG nef. PEP

MGKWSKC¹IVG²PE³VR⁴IR⁵TP⁶PA⁷AV⁸GV⁹AV¹⁰SD¹¹LAK¹²HG¹³AIT¹⁴SS¹⁵TA¹⁶AN¹⁷PD¹⁸CA¹⁹W²⁰LE²¹AQ²²EE²³SE²⁴VG²⁵FP²⁶VR²⁷PQ²⁸VL²⁹RP³⁰MT³¹YK³²GA³³FD³⁴LS³⁵FF³⁶L³⁷
 KEK³⁸G³⁹LD⁴⁰GL⁴¹IY⁴²SK⁴³QR⁴⁴QD⁴⁵IL⁴⁶DL⁴⁷WV⁴⁸NT⁴⁹QG⁵⁰FF⁵¹PD⁵²WQ⁵³NY⁵⁴TP⁵⁵GP⁵⁶TR⁵⁷YPL⁵⁸T⁵⁹FG⁶⁰WC⁶¹FK⁶²LE⁶³PV⁶⁴DP⁶⁵AE⁶⁶VE⁶⁷EA⁶⁸TG⁶⁹EN⁷⁰NS⁷¹LL⁷²HP⁷³IC⁷⁴QH⁷⁵GM⁷⁶ED⁷⁷AD⁷⁸NE⁷⁹VL⁸⁰W⁸¹
 RFD⁸²SSL⁸³ARR⁸⁴H⁸⁵IA⁸⁶REL⁸⁷HP⁸⁸DF⁸⁹YK⁹⁰DC⁹¹\$

Fig. 106B

2003 CON 14 BG nef. OPT

AT¹GG²CGG³CA⁴AG⁵TG⁶TC⁷CA⁸AG⁹TG¹⁰CT¹¹CC¹²AT¹³CG¹⁴TG¹⁵GG¹⁶CT¹⁷GG¹⁸CG¹⁹GAG²⁰GT²¹GG²²CG²³GAG²⁴CG²⁵CA²⁶TC²⁷CC²⁸TA²⁹CA³⁰AC³¹CG³²CG³³CA³⁴AA³⁵AC³⁶CC³⁷GAC³⁸TG³⁹CG⁴⁰CT⁴¹GG⁴²CG⁴³CG⁴⁴CG⁴⁵CG⁴⁶CG⁴⁷CG⁴⁸CG⁴⁹CG⁵⁰CG⁵¹CG⁵²CG⁵³CG⁵⁴CG⁵⁵CG⁵⁶CG⁵⁷CG⁵⁸CG⁵⁹CG⁶⁰CG⁶¹CG⁶²CG⁶³CG⁶⁴CG⁶⁵CG⁶⁶CG⁶⁷CG⁶⁸CG⁶⁹CG⁷⁰CG⁷¹CG⁷²CG⁷³CG⁷⁴CG⁷⁵CG⁷⁶CG⁷⁷CG⁷⁸CG⁷⁹CG⁸⁰CG⁸¹CG⁸²CG⁸³CG⁸⁴CG⁸⁵CG⁸⁶CG⁸⁷CG⁸⁸CG⁸⁹CG⁹⁰CG⁹¹CG⁹²CG⁹³CG⁹⁴CG⁹⁵CG⁹⁶CG⁹⁷CG⁹⁸CG⁹⁹CG¹⁰⁰CG¹⁰¹CG¹⁰²CG¹⁰³CG¹⁰⁴CG¹⁰⁵CG¹⁰⁶CG¹⁰⁷CG¹⁰⁸CG¹⁰⁹CG¹¹⁰CG¹¹¹CG¹¹²CG¹¹³CG¹¹⁴CG¹¹⁵CG¹¹⁶CG¹¹⁷CG¹¹⁸CG¹¹⁹CG¹²⁰CG¹²¹CG¹²²CG¹²³CG¹²⁴CG¹²⁵CG¹²⁶CG¹²⁷CG¹²⁸CG¹²⁹CG¹³⁰CG¹³¹CG¹³²CG¹³³CG¹³⁴CG¹³⁵CG¹³⁶CG¹³⁷CG¹³⁸CG¹³⁹CG¹⁴⁰CG¹⁴¹CG¹⁴²CG¹⁴³CG¹⁴⁴CG¹⁴⁵CG¹⁴⁶CG¹⁴⁷CG¹⁴⁸CG¹⁴⁹CG¹⁵⁰CG¹⁵¹CG¹⁵²CG¹⁵³CG¹⁵⁴CG¹⁵⁵CG¹⁵⁶CG¹⁵⁷CG¹⁵⁸CG¹⁵⁹CG¹⁶⁰CG¹⁶¹CG¹⁶²CG¹⁶³CG¹⁶⁴CG¹⁶⁵CG¹⁶⁶CG¹⁶⁷CG¹⁶⁸CG¹⁶⁹CG¹⁷⁰CG¹⁷¹CG¹⁷²CG¹⁷³CG¹⁷⁴CG¹⁷⁵CG¹⁷⁶CG¹⁷⁷CG¹⁷⁸CG¹⁷⁹CG¹⁸⁰CG¹⁸¹CG¹⁸²CG¹⁸³CG¹⁸⁴CG¹⁸⁵CG¹⁸⁶CG¹⁸⁷CG¹⁸⁸CG¹⁸⁹CG¹⁹⁰CG¹⁹¹CG¹⁹²CG¹⁹³CG¹⁹⁴CG¹⁹⁵CG¹⁹⁶CG¹⁹⁷CG¹⁹⁸CG¹⁹⁹CG²⁰⁰CG²⁰¹CG²⁰²CG²⁰³CG²⁰⁴CG²⁰⁵CG²⁰⁶CG²⁰⁷CG²⁰⁸CG²⁰⁹CG²¹⁰CG²¹¹CG²¹²CG²¹³CG²¹⁴CG²¹⁵CG²¹⁶CG²¹⁷CG²¹⁸CG²¹⁹CG²²⁰CG²²¹CG²²²CG²²³CG²²⁴CG²²⁵CG²²⁶CG²²⁷CG²²⁸CG²²⁹CG²³⁰CG²³¹CG²³²CG²³³CG²³⁴CG²³⁵CG²³⁶CG²³⁷CG²³⁸CG²³⁹CG²⁴⁰CG²⁴¹CG²⁴²CG²⁴³CG²⁴⁴CG²⁴⁵CG²⁴⁶CG²⁴⁷CG²⁴⁸CG²⁴⁹CG²⁵⁰CG²⁵¹CG²⁵²CG²⁵³CG²⁵⁴CG²⁵⁵CG²⁵⁶CG²⁵⁷CG²⁵⁸CG²⁵⁹CG²⁶⁰CG²⁶¹CG²⁶²CG²⁶³CG²⁶⁴CG²⁶⁵CG²⁶⁶CG²⁶⁷CG²⁶⁸CG²⁶⁹CG²⁷⁰CG²⁷¹CG²⁷²CG²⁷³CG²⁷⁴CG²⁷⁵CG²⁷⁶CG²⁷⁷CG²⁷⁸CG²⁷⁹CG²⁸⁰CG²⁸¹CG²⁸²CG²⁸³CG²⁸⁴CG²⁸⁵CG²⁸⁶CG²⁸⁷CG²⁸⁸CG²⁸⁹CG²⁹⁰CG²⁹¹CG²⁹²CG²⁹³CG²⁹⁴CG²⁹⁵CG²⁹⁶CG²⁹⁷CG²⁹⁸CG²⁹⁹CG³⁰⁰CG³⁰¹CG³⁰²CG³⁰³CG³⁰⁴CG³⁰⁵CG³⁰⁶CG³⁰⁷CG³⁰⁸CG³⁰⁹CG³¹⁰CG³¹¹CG³¹²CG³¹³CG³¹⁴CG³¹⁵CG³¹⁶CG³¹⁷CG³¹⁸CG³¹⁹CG³²⁰CG³²¹CG³²²CG³²³CG³²⁴CG³²⁵CG³²⁶CG³²⁷CG³²⁸CG³²⁹CG³³⁰CG³³¹CG³³²CG³³³CG³³⁴CG³³⁵CG³³⁶CG³³⁷CG³³⁸CG³³⁹CG³⁴⁰CG³⁴¹CG³⁴²CG³⁴³CG³⁴⁴CG³⁴⁵CG³⁴⁶CG³⁴⁷CG³⁴⁸CG³⁴⁹CG³⁵⁰CG³⁵¹CG³⁵²CG³⁵³CG³⁵⁴CG³⁵⁵CG³⁵⁶CG³⁵⁷CG³⁵⁸CG³⁵⁹CG³⁶⁰CG³⁶¹CG³⁶²CG³⁶³CG³⁶⁴CG³⁶⁵CG³⁶⁶CG³⁶⁷CG³⁶⁸CG³⁶⁹CG³⁷⁰CG³⁷¹CG³⁷²CG³⁷³CG³⁷⁴CG³⁷⁵CG³⁷⁶CG³⁷⁷CG³⁷⁸CG³⁷⁹CG³⁸⁰CG³⁸¹CG³⁸²CG³⁸³CG³⁸⁴CG³⁸⁵CG³⁸⁶CG³⁸⁷CG³⁸⁸CG³⁸⁹CG³⁹⁰CG³⁹¹CG³⁹²CG³⁹³CG³⁹⁴CG³⁹⁵CG³⁹⁶CG³⁹⁷CG³⁹⁸CG³⁹⁹CG⁴⁰⁰CG⁴⁰¹CG⁴⁰²CG⁴⁰³CG⁴⁰⁴CG⁴⁰⁵CG⁴⁰⁶CG⁴⁰⁷CG⁴⁰⁸CG⁴⁰⁹CG⁴¹⁰CG⁴¹¹CG⁴¹²CG⁴¹³CG⁴¹⁴CG⁴¹⁵CG⁴¹⁶CG⁴¹⁷CG⁴¹⁸CG⁴¹⁹CG⁴²⁰CG⁴²¹CG⁴²²CG⁴²³CG⁴²⁴CG⁴²⁵CG⁴²⁶CG⁴²⁷CG⁴²⁸CG⁴²⁹CG⁴³⁰CG⁴³¹CG⁴³²CG⁴³³CG⁴³⁴CG⁴³⁵CG⁴³⁶CG⁴³⁷CG⁴³⁸CG⁴³⁹CG⁴⁴⁰CG⁴⁴¹CG⁴⁴²CG⁴⁴³CG⁴⁴⁴CG⁴⁴⁵CG⁴⁴⁶CG⁴⁴⁷CG⁴⁴⁸CG⁴⁴⁹CG⁴⁵⁰CG⁴⁵¹CG⁴⁵²CG⁴⁵³CG⁴⁵⁴CG⁴⁵⁵CG⁴⁵⁶CG⁴⁵⁷CG⁴⁵⁸CG⁴⁵⁹CG⁴⁶⁰CG⁴⁶¹CG⁴⁶²CG⁴⁶³CG⁴⁶⁴CG⁴⁶⁵CG⁴⁶⁶CG⁴⁶⁷CG⁴⁶⁸CG⁴⁶⁹CG⁴⁷⁰CG⁴⁷¹CG⁴⁷²CG⁴⁷³CG⁴⁷⁴CG⁴⁷⁵CG⁴⁷⁶CG⁴⁷⁷CG⁴⁷⁸CG⁴⁷⁹CG⁴⁸⁰CG⁴⁸¹CG⁴⁸²CG⁴⁸³CG⁴⁸⁴CG⁴⁸⁵CG⁴⁸⁶CG⁴⁸⁷CG⁴⁸⁸CG⁴⁸⁹CG⁴⁹⁰CG⁴⁹¹CG⁴⁹²CG⁴⁹³CG⁴⁹⁴CG⁴⁹⁵CG⁴⁹⁶CG⁴⁹⁷CG⁴⁹⁸CG⁴⁹⁹CG⁵⁰⁰CG⁵⁰¹CG⁵⁰²CG⁵⁰³CG⁵⁰⁴CG⁵⁰⁵CG⁵⁰⁶CG⁵⁰⁷CG⁵⁰⁸CG⁵⁰⁹CG⁵¹⁰CG⁵¹¹CG⁵¹²CG⁵¹³CG⁵¹⁴CG⁵¹⁵CG⁵¹⁶CG⁵¹⁷CG⁵¹⁸CG⁵¹⁹CG⁵²⁰CG⁵²¹CG⁵²²CG⁵²³CG⁵²⁴CG⁵²⁵CG⁵²⁶CG⁵²⁷CG⁵²⁸CG⁵²⁹CG⁵³⁰CG⁵³¹CG⁵³²CG⁵³³CG⁵³⁴CG⁵³⁵CG⁵³⁶CG⁵³⁷CG⁵³⁸CG⁵³⁹CG⁵⁴⁰CG⁵⁴¹CG⁵⁴²CG⁵⁴³CG⁵⁴⁴CG⁵⁴⁵CG⁵⁴⁶CG⁵⁴⁷CG⁵⁴⁸CG⁵⁴⁹CG⁵⁵⁰CG⁵⁵¹CG⁵⁵²CG⁵⁵³CG⁵⁵⁴CG⁵⁵⁵CG⁵⁵⁶CG⁵⁵⁷CG⁵⁵⁸CG⁵⁵⁹CG⁵⁶⁰CG⁵⁶¹CG⁵⁶²CG⁵⁶³CG⁵⁶⁴CG⁵⁶⁵CG⁵⁶⁶CG⁵⁶⁷CG⁵⁶⁸CG⁵⁶⁹CG⁵⁷⁰CG⁵⁷¹CG⁵⁷²CG⁵⁷³CG⁵⁷⁴CG⁵⁷⁵CG⁵⁷⁶CG⁵⁷⁷CG⁵⁷⁸CG⁵⁷⁹CG⁵⁸⁰CG⁵⁸¹CG⁵⁸²CG⁵⁸³CG⁵⁸⁴CG⁵⁸⁵CG⁵⁸⁶CG⁵⁸⁷CG⁵⁸⁸CG⁵⁸⁹CG⁵⁹⁰CG⁵⁹¹CG⁵⁹²CG⁵⁹³CG⁵⁹⁴CG⁵⁹⁵CG⁵⁹⁶CG⁵⁹⁷CG⁵⁹⁸CG⁵⁹⁹CG⁶⁰⁰CG⁶⁰¹CG⁶⁰²CG⁶⁰³CG⁶⁰⁴CG⁶⁰⁵CG⁶⁰⁶CG⁶⁰⁷CG⁶⁰⁸CG⁶⁰⁹CG⁶¹⁰CG⁶¹¹CG⁶¹²CG⁶¹³CG⁶¹⁴CG⁶¹⁵CG⁶¹⁶CG⁶¹⁷CG⁶¹⁸CG⁶¹⁹CG⁶²⁰CG⁶²¹CG⁶²²CG⁶²³CG⁶²⁴CG⁶²⁵CG⁶²⁶CG⁶²⁷CG⁶²⁸CG⁶²⁹CG⁶³⁰CG⁶³¹CG⁶³²CG⁶³³CG⁶³⁴CG⁶³⁵CG⁶³⁶CG⁶³⁷CG⁶³⁸CG⁶³⁹CG⁶⁴⁰CG⁶⁴¹CG⁶⁴²CG⁶⁴³CG⁶⁴⁴CG⁶⁴⁵CG⁶⁴⁶CG⁶⁴⁷CG⁶⁴⁸CG⁶⁴⁹CG⁶⁵⁰CG⁶⁵¹CG⁶⁵²CG⁶⁵³CG⁶⁵⁴CG⁶⁵⁵CG⁶⁵⁶CG⁶⁵⁷CG⁶⁵⁸CG⁶⁵⁹CG⁶⁶⁰CG⁶⁶¹CG⁶⁶²CG⁶⁶³CG⁶⁶⁴CG⁶⁶⁵CG⁶⁶⁶CG⁶⁶⁷CG⁶⁶⁸CG⁶⁶⁹CG⁶⁷⁰CG⁶⁷¹CG⁶⁷²CG⁶⁷³CG⁶⁷⁴CG⁶⁷⁵CG⁶⁷⁶CG⁶⁷⁷CG⁶⁷⁸CG⁶⁷⁹CG⁶⁸⁰CG⁶⁸¹CG⁶⁸²CG⁶⁸³CG⁶⁸⁴CG⁶⁸⁵CG⁶⁸⁶CG⁶⁸⁷CG⁶⁸⁸CG⁶⁸⁹CG⁶⁹⁰CG⁶⁹¹CG⁶⁹²CG⁶⁹³CG⁶⁹⁴CG⁶⁹⁵CG⁶⁹⁶CG⁶⁹⁷CG⁶⁹⁸CG⁶⁹⁹CG⁷⁰⁰CG⁷⁰¹CG⁷⁰²CG⁷⁰³CG⁷⁰⁴CG⁷⁰⁵CG⁷⁰⁶CG⁷⁰⁷CG⁷⁰⁸CG⁷⁰⁹CG⁷¹⁰CG⁷¹¹CG⁷¹²CG⁷¹³CG⁷¹⁴CG⁷¹⁵CG⁷¹⁶CG⁷¹⁷CG⁷¹⁸CG⁷¹⁹CG⁷²⁰CG⁷²¹CG⁷²²CG⁷²³CG⁷²⁴CG⁷²⁵CG⁷²⁶CG⁷²⁷CG⁷²⁸CG⁷²⁹CG⁷³⁰CG⁷³¹CG⁷³²CG⁷³³CG⁷³⁴CG⁷³⁵CG⁷³⁶CG⁷³⁷CG⁷³⁸CG⁷³⁹CG⁷⁴⁰CG⁷⁴¹CG⁷⁴²CG⁷⁴³CG⁷⁴⁴CG⁷⁴⁵CG⁷⁴⁶CG⁷⁴⁷CG⁷⁴⁸CG⁷⁴⁹CG⁷⁵⁰CG⁷⁵¹CG⁷⁵²CG⁷⁵³CG⁷⁵⁴CG⁷⁵⁵CG⁷⁵⁶CG⁷⁵⁷CG⁷⁵⁸CG⁷⁵⁹CG⁷⁶⁰CG⁷⁶¹CG⁷⁶²CG⁷⁶³CG⁷⁶⁴CG⁷⁶⁵CG⁷⁶⁶CG⁷⁶⁷CG⁷⁶⁸CG⁷⁶⁹CG⁷⁷⁰CG⁷⁷¹CG⁷⁷²CG⁷⁷³CG⁷⁷⁴CG⁷⁷⁵CG⁷⁷⁶CG⁷⁷⁷CG⁷⁷⁸CG⁷⁷⁹CG⁷⁸⁰CG⁷⁸¹CG⁷⁸²CG⁷⁸³CG⁷⁸⁴CG⁷⁸⁵CG⁷⁸⁶CG⁷⁸⁷CG⁷⁸⁸CG⁷⁸⁹CG⁷⁹⁰CG⁷⁹¹CG⁷⁹²CG⁷⁹³CG⁷⁹⁴CG⁷⁹⁵CG⁷⁹⁶CG⁷⁹⁷CG⁷⁹⁸CG⁷⁹⁹CG⁸⁰⁰CG⁸⁰¹CG⁸⁰²CG⁸⁰³CG⁸⁰⁴CG⁸⁰⁵CG⁸⁰⁶CG⁸⁰⁷CG⁸⁰⁸CG⁸⁰⁹CG⁸¹⁰CG⁸¹¹CG⁸¹²CG⁸¹³CG⁸¹⁴CG⁸¹⁵CG⁸¹⁶CG⁸¹⁷CG⁸¹⁸CG⁸¹⁹CG⁸²⁰CG⁸²¹CG⁸²²CG⁸²³CG⁸²⁴CG⁸²⁵CG⁸²⁶CG⁸²⁷CG⁸²⁸CG⁸²⁹CG⁸³⁰CG⁸³¹CG⁸³²CG⁸³³CG⁸³⁴CG⁸³⁵CG⁸³⁶CG⁸³⁷CG⁸³⁸CG⁸³⁹CG⁸⁴⁰CG⁸⁴¹CG⁸⁴²CG⁸⁴³CG⁸⁴⁴CG⁸⁴⁵CG⁸⁴⁶CG⁸⁴⁷CG⁸⁴⁸CG⁸⁴⁹CG⁸⁵⁰CG⁸⁵¹CG⁸⁵²CG⁸⁵³CG⁸⁵⁴CG⁸⁵⁵CG⁸⁵⁶CG⁸⁵⁷CG⁸⁵⁸CG⁸⁵⁹CG⁸⁶⁰CG⁸⁶¹CG⁸⁶²CG⁸⁶³CG⁸⁶⁴CG⁸⁶⁵CG⁸⁶⁶CG⁸⁶⁷CG⁸⁶⁸CG⁸⁶⁹CG⁸⁷⁰CG⁸⁷¹CG⁸⁷²CG⁸⁷³CG⁸⁷⁴CG⁸⁷⁵CG⁸⁷⁶CG⁸⁷⁷CG⁸⁷⁸CG⁸⁷⁹CG⁸⁸⁰CG⁸⁸¹CG⁸⁸²CG⁸⁸³CG⁸⁸⁴CG⁸⁸⁵CG⁸⁸⁶CG⁸⁸⁷CG⁸⁸⁸CG⁸⁸⁹CG⁸⁹⁰CG⁸⁹¹CG⁸⁹²CG⁸⁹³CG⁸⁹⁴CG⁸⁹⁵CG⁸⁹⁶CG⁸⁹⁷CG⁸⁹⁸CG⁸⁹⁹CG⁹⁰⁰CG⁹⁰¹CG⁹⁰²CG⁹⁰³CG⁹⁰⁴CG⁹⁰⁵CG⁹⁰⁶CG⁹⁰⁷CG⁹⁰⁸CG⁹⁰⁹CG⁹¹⁰CG⁹¹¹CG⁹¹²CG⁹¹³CG⁹¹⁴CG⁹¹⁵CG⁹¹⁶CG⁹¹⁷CG⁹¹⁸CG⁹¹⁹CG⁹²⁰CG⁹²¹CG⁹²²CG⁹²³CG⁹²⁴CG⁹²⁵CG⁹²⁶CG⁹²⁷CG⁹²⁸CG⁹²⁹CG⁹³⁰CG⁹³¹CG⁹³²CG⁹³³CG⁹³⁴CG⁹³⁵CG⁹³⁶CG⁹³⁷CG⁹³⁸CG⁹³⁹CG⁹⁴⁰CG⁹⁴¹CG⁹⁴²CG⁹⁴³CG⁹⁴⁴CG⁹⁴⁵CG⁹⁴⁶CG⁹⁴⁷CG⁹⁴⁸CG⁹⁴⁹CG⁹⁵⁰CG⁹⁵¹CG⁹⁵²CG⁹⁵³CG⁹⁵⁴CG⁹⁵⁵CG⁹⁵⁶CG⁹⁵⁷CG⁹⁵⁸CG⁹⁵⁹CG⁹⁶⁰CG⁹⁶¹CG⁹⁶²CG⁹⁶³CG⁹⁶⁴CG⁹⁶⁵CG⁹⁶⁶CG⁹⁶⁷CG⁹⁶⁸CG⁹⁶⁹CG⁹⁷⁰CG⁹⁷¹CG⁹⁷²CG⁹⁷³CG⁹⁷⁴CG⁹⁷⁵CG⁹⁷⁶CG⁹⁷⁷CG⁹⁷⁸CG⁹⁷⁹CG⁹⁸⁰CG⁹⁸¹CG⁹⁸²CG⁹⁸³CG⁹⁸⁴CG⁹⁸⁵CG⁹⁸⁶CG⁹⁸⁷CG⁹⁸⁸CG⁹⁸⁹CG⁹⁹⁰CG⁹⁹¹CG⁹⁹²CG⁹⁹³CG⁹⁹⁴CG⁹⁹⁵CG⁹⁹⁶CG⁹⁹⁷CG⁹⁹⁸CG⁹⁹⁹CG¹⁰⁰⁰CG¹⁰⁰¹CG¹⁰⁰²CG¹⁰⁰³CG¹⁰⁰⁴CG¹⁰⁰⁵CG¹⁰⁰⁶CG¹⁰⁰⁷CG¹⁰⁰⁸CG¹⁰⁰⁹CG¹⁰¹⁰CG¹⁰¹¹CG¹⁰¹²CG¹⁰¹³CG¹⁰¹⁴CG¹⁰¹⁵CG¹⁰¹⁶CG¹⁰¹⁷CG¹⁰¹⁸CG¹⁰¹⁹CG¹⁰²⁰CG¹⁰²¹CG¹⁰²²CG¹⁰²³CG¹⁰²⁴CG¹⁰²⁵CG¹⁰²⁶CG¹⁰²⁷CG¹⁰²⁸CG¹⁰²⁹CG¹⁰³⁰CG¹⁰³¹CG¹⁰³²CG¹⁰³³CG¹⁰³⁴CG¹⁰³⁵CG¹⁰³⁶CG¹⁰³⁷CG¹⁰³⁸CG¹⁰³⁹CG¹⁰⁴⁰CG¹⁰⁴¹CG¹⁰⁴²CG¹⁰⁴³CG¹⁰⁴⁴CG¹⁰⁴⁵CG¹⁰⁴⁶CG¹⁰⁴⁷CG¹⁰⁴⁸CG¹⁰⁴⁹CG¹⁰⁵⁰CG¹⁰⁵¹CG¹⁰⁵²CG¹⁰⁵³CG¹⁰⁵⁴CG¹⁰⁵⁵CG¹⁰⁵⁶CG¹⁰⁵⁷CG¹⁰⁵⁸CG¹⁰⁵⁹CG¹⁰⁶⁰CG¹⁰⁶¹CG¹⁰⁶²CG¹⁰⁶³CG¹⁰⁶⁴CG¹⁰⁶⁵CG¹⁰⁶⁶CG¹⁰⁶⁷CG¹⁰⁶⁸CG¹⁰⁶⁹CG¹⁰⁷⁰CG¹⁰⁷¹CG¹⁰⁷²CG¹⁰⁷³CG¹⁰⁷⁴CG¹⁰⁷⁵CG¹⁰⁷⁶CG¹⁰⁷⁷CG¹⁰⁷⁸CG¹⁰⁷⁹CG¹⁰⁸⁰CG¹⁰⁸¹CG¹⁰⁸²CG¹⁰⁸³CG¹⁰⁸⁴CG¹⁰⁸⁵CG¹⁰⁸⁶CG¹⁰⁸⁷CG¹⁰⁸⁸CG¹⁰⁸⁹CG¹⁰⁹⁰CG¹⁰⁹¹CG¹⁰⁹²CG¹⁰⁹³CG¹⁰⁹⁴CG¹⁰⁹⁵CG¹⁰⁹⁶CG¹⁰⁹⁷CG¹⁰⁹⁸CG¹⁰⁹⁹CG¹¹⁰⁰CG¹¹⁰¹CG¹¹⁰²CG¹¹⁰³CG¹¹⁰⁴CG¹¹⁰⁵CG¹¹⁰⁶CG¹¹⁰⁷CG¹¹⁰⁸CG¹¹⁰⁹CG¹¹¹⁰CG¹¹¹¹CG¹¹¹²CG¹¹¹³CG¹¹¹⁴CG¹¹¹⁵CG¹¹¹⁶CG¹¹¹⁷CG¹¹¹⁸CG¹¹¹⁹CG

Fig. 107B

2003_con_s pol.1.OPT

TTCTTCCGCGAGAACTGGCCCTTCCAGCAGGGCGAGGCCGCGAGTTCTCTCCGAGCAGACCCGCGCAACTCCCCACCTCCCGCGAGCTGCGCGTGCG
CGGCGGCGACAAACCCCTGTCCGAGCGCGCGGAGCGCCAGGGCACCGTGTCTCTTCCCCAGATCACCTGTGGCAGCGCCCCCTGGTGACCG
TGAAGATCGGCGGCCAGCTGAAGAGGCCCTGCTGGACACCGGCGCCGACGACACCGTGTGGAGGAGATCAACCTGCCCCGCAAGTGGAAGCCCAAGATG
ATGCGCGCATCGGCGGCTTCATCAAGGTGCGCCAGTACGACAGATCCTGATCGAGATCTGCGCAAGAAAGGCCATCGGCACCGTGTGGTGGGCCCCAC
CCCCGTGAACATCATCGGCGCGCAACATGCTGACCCAGATCGGCTGCACCTGAACCTTCCCCATCTCCCCATCGAGACCGTGGCCGTGAAGCTGAAGCCCCG
GCATGGACGGCCCCAAGTGAAGCAGTGGCCCCGTGACCGAGGAGAGATCAAGGCCCTGACCGAGATCTGCACCGAGATGGAGAAGGAGGCAAGATCTCC
AAGATCGGCCCCGAGAACCCCTACAACACCCCATCTTCGCCATCAAGAAGGAATCCACCAAGTGGCGAAGCTGGTGGACTTCCGCGAGCTGAACAA
GGCACCCAGGACTTCTGGGAGGTGACGTGGGCATCCCCACCCCGCGGCCCTGAAGAAGAAGTCCGTGACCCGTGTGGACGTGGGCGACGCCCTACT
TCTCCGTGCCCTGGACGAGGACTTCCGCAAGTACACCGCTTACCATCCCCCTCCATCAACAACGAGACCCCCGGCATCCGCTACCAGTACAACGTGCTG
CCCCAGGCTGGAAGGCTCCCCCGCCATCTTCAGTCTCCATGACCAAGATCTTGAGGCCCTTCCGACCCAGAACCCCCGAGATCGTGATCTACCACTA
CATGGACGACCTGTACGTGGGCTCCGACCTGGAGATCGGCCAGCACCGCACCAAGATCGAGGAGCTGCGGAGACCTGCTGCGCTGGGCTTCAACACCC
CCGACAAGAACCAAGAGGAGCCCCCTTCTGTGGATGGGTACGAGTGCACCCGACAAGTGGACCGTGCAGCCATCCAGCTGCCCGAGAAGGAC
TCCTGGACCGTGAACGACATCCAGAAGCTGGTGGCAAGCTGAACCTGGGCTCCAGATCTACCCCGCATCAAGTGAAGCAGCTGTGCAAGCTGCTGCG
CGGCGCAAGGCCCTGACCGACATCGTGCCCTGACCGAGGAGGCCGAGCTGGAGCTGGCCGAGAACCGCGAGATCTGTAAGGAGCCCCGTGCACGGCGTGT
ACTACGACCCCTCCAGGACCTGTATGCGCGAGATCCAGAAGCAGGGCCAGGACCACTGGACCTACAGATCTACAGGAGCCCTTCAAGAACCTGAAGACC
GGCAAGTACGCCAAGATCGCTCCGCCACACCAACGACGTGAAGCAGCTGACCGAGGCCGTGCAGAAGATCGCCACCGAGTCCATCGTGATCTGGGGCAA
GACCCCAAGTTCGCGCTGCCATCCAGAAGGAGACCTGGGAGACCTGGTGGACCGAGTACTGGCAGGCCACCTGGATCCCCGAGTGGGAGTTCGTGAACA
CCCCCCCCCTGGTGAAGCTGTGGTACCAGCTGGAGAACGCCATCGTGGGCGCCGAGACCTTCTACGTGGACGGCGCCGCCAACCCGCGAGACCAAGCTG
GGCAAGCGCGGTACGTGACCGACCGCGCGGCCAGAGGTGTCTCCCTGACCGAGACCAACCAAGAGTGCAGGCCATCCACCTGGCCCT
GCAGGACTCCGGCTCCGAGGTGAACATCGTGACCGACTCCAGTACGCCCTGGGCATCATCCAGGCCCAGCCCCGACAGTCCGAGTCCGAGTGGTGAACC
AGATCATCGAGCAGCTGATCAAGAAGGAGAGGTGTACCTGTCTGGTGCCCGCCACAAAGGGCATCGGCGGCAACGAGCAGGTGGACAAGCTGGTGTCC
ACCGGCATCCGCAAGGTGCTGTTCTTGACGGCATCGACAAGGCCAGGAGGAGCACGAGAAGTACCACTCCAAGTGGCGGCCATGGCCCTCCGACTTCAA
CCTGCCCCCATCGTGGCCAAAGGATCGTGGCTCTCTGGCATCCCTTACAAACCCCAAGTGAAGGGCGAGGCCATGCACGGCCAGGTGGACTGCTCCCCCGGCATCT
GGCAGCTGGAATGCAACCCACCTGGAGGGCAAGATCATCTGTGTGGCGGTGCACGTGGCTCCGGCTACATCGAGGCCGAGGTGATCCCCCGCGAGACCCGGC
CAGGAGACCGCTACTTCTATCTGAAGTGGCGGCCGCTGGCCCGTGAAGTGTATCCACACCGACACCGCTCCAACTTCACCTCCGCCCGCCGCTGAAGGC
CGCTGTGTGGCGCGCATCCAGCAGGAGTTCGGCATCCCTTACAAACCCCAAGTCCAGGGCGTGGTGGAGTCCATGAACAAGGAGCTGAAGAAGATCA
TCGGCCAGGTGCGGACCGCGGAGCACCTGAAGACCGCGGTGCAGATGGCCGTGTTTCATCCACAACCTTCAAGCGCAAGGGCGGATTCGGCGGCTACTCC
GCCGCGAGCGCATCATCGACATCATCGCCACCGACATCCAGACCAAGGAGCTGCAGAAGCAGATCACCAGATCCAGAACTTCCGCGGTGTACTACCGCGA
CTCCCGGACCCCATCTGGAAGGGCCCGCAAGCTGTGTGAAGGGCGAGGGCGCGCTGGTGTATCCAGGACAACTCCAGATCAAGGTGGTGGCCCCCGCC
GCAAGGCCAAGATCATCCGCGACTACGCGCAAGCAGATGGCCGGCGCGCCGCGCGAGGACGAGGACTAA

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Fig. 108A

62. 2003 M GROUP and pol. PEP

FFRENLAFOQGEAREFSSEQTRANSPTSRELVRGGNDPLSEAGAERQGTVSFSPQITLWQRPVLTIKIGGQREALDGTGADDTVLEEIN
 LPGWKPKMIGGIGGFIKVRQYDQILIEICGKKAIGTVLVGPTPVNIIGRNMLTQIGCTLNFPISPIETVPVKLPGMDGPKVKQWPLTEEK
 IKALTEICTEMEKEGKISKIGPENPYNTPVFAIKKKDSTKWRKLVDFRELNKRQTDFWEVOLGIPHPAGLKKKSVTVLVDGDAYFSVPLDE
 DFRKYTAFTIPSTNNETPGIRYQYNVLPQGWKGSPIAFQSSMTKILEPFRKTNPEIYIYQYMDLTVGSDEIGQHRAKIEELREHLLRWGF
 TTPDKKHQKEPPFLWMGYELHPDKWTVQPIQLPEKDSWTVDIQKLVGKLNWASQIYPGKVKQLCKLLRGAKALTDIVPLTEEALELEAEN
 REILKEPVHGVYDPSKDLIAEIQKQGDQWTVQIYQEPFKNLKTGKYAKMRSHTNDVKQLTEAVQKIATESIIVGWKTPKFRLPKIQKETW
 ETWWEYQATWIPWEFEVNTPPVLKLVQLEKEPIVGAETFYVDGAANRETCLGKAGYVTDGRQKVVSLETETNQKTELQAIHLALQDSG
 SEVNIIVTDSQYALGIIQAQPKSESELVNOIEQLIKKEKVLVSWPAHKGIGGNEQVDKLVSSGIRKVLFLDGDIDKAQEEHEKYHSNWRAM
 ASDFNLPVVAKEIVASCDKQKGEAMHGQVDCSPGIWQDCTHLEGKVLVAVHVASGYIEAEVIPAETGQETAYFILKLAGRWPVKVIH
 TDNGSNFTSAAVKAACWWAGIQQEFGIPYNPQSGVVESEMNKELKKIIGQVRDQAEHLKTAVMQMAVFIHNFRRKGGIGGYSAGERIIDIIAT
 DIQTKELQKQITKIQNFVRVYRDSRDPWKGPAKLLWKGEAVVIQDNSEIKVVPRRKAKIIRDYKGQMAGDDCVAGRQDED\$

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Fig. 109A

63. 2003 CON A1 pol. PEP

FFRENLAFOQGEAREFSSEQTRANSPTSRDLWDGGRDPLSEAGAERQGTGPTTSFPQITLWQRPVLTIRIGGQKEALLDTGADDTVLEDI
 NLPGWKPKMIGGIGGFIKVRQYDQILIEICGKKAIGTVLVGPTPVNIIGRNMLTQIGCTLNFPISPIETVPVKLPGMDGPKVKQWPLTEE
 KIKALTEICTEMEKEGKISKIGPENPYNTPIFAIKKKDSTKWRKLVDFRELNKRQTDFWEVOLGIPHPAGLKKKSVTVLVDGDAYFSVPLD
 ESFRKYTAFTIPSTNNETPGIRYQYNVLPQGWKGSPIAFQSSMTKILEPFRSKNPEIYIYQYMDLTVGSDEIGQHRTKIEELRAHLLSWG
 FTTTPDKKHQKEPPFLWMGYELHPDKWTVQPIELPEKESWTVDIQKLVGKLNWASQIYAGIKVKQLCKLLRGAKALTDIVTLTEEALELEAE
 NREILKDPVHGVYDPSKDLIAEIQKQGDQWTVQIYQEPFKNLKTGKYARKRSHTNDVKQLAEVQKVVMESIVIWGKTPKFKLPKIQKET
 WETWMDYQATWIPWEFEVNTPPVLKLVQLEKDPVGAETFYVDGAANRETCLGKAGYVTDGRQKVVSLETETNQKTELHAIHLALQDS
 GSEVNIIVTDSQYALGIIQAQPKSESELVNOIEQLIKGDKVYLSWVPAHKGIGGNEQVDKLVSSGIRKVLFLDGDIDKAQEEHEKYHSNWR
 MASDENLPPIVAKEIVASCDKQKGEAMHGQVDCSPGIWQDCTHLEGKVLVAVHVASGYIEAEVIPAETGQETAYFILKLAGRWPVKV
 HTDNGSNFTSAAVKAACWWANIQQEFGIPYNPQSGVVESEMNKELKKIIGQVREQAEHLKTAVMQMAVFIHNFRRKGGIGGYSAGERIIDIIA
 TDIQTKELQKQITKIQNFVRVYRDSRDPWKGPAKLLWKGEAVVIQDNSEIKVVPRRKAKIIRDYKGQMAGDDCVAGRQDED\$

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Fig. 109C

64. 2003 A1.anc pol. PEP

FFRENLAFOQGEARKFSSEQTRANSPTSRELWDGGRDSSLSEAGAERQGTVPFSFPQITLWQRPPLVTVKIGGQKKEALLDTGADDTVLEDI
NLP GKWKPKMIGGIGGFIVKVRQYDQILIEICGKKAIGTVLVGPTPVNIIGRNMLTQIGCTLNFPISPIETVPVKLPGMDGPKVKQWPLTEE
KIKALTEICTEMEKEGKISKIGPENPYNTPVFAIKKDDSTKWRKLVDFRELNKRTOQDFWEVQLGIPHPAGLKKKKSVTVLDVGDAYFVSPLD
ESFRKYTAFTIPINNTPGIRYQYNVLPQGWKGSPIAFQSSMTKILEPFRSKNPEIYIYQYMDLQVGSDEIGQHRAKIEELRAHLLSWG
FTTPDKKHQKEPPFLWMGYELHPDKWTVPQPIKLPEKDSWTVNDIQKLVGKLNWASQIYAGIKVKQLCKLLRGAKALTDIVTLTEEAEELELAE
NREILKDPVHGYYDPSKDLVAEIQKQDQWTYQIYQEPFKNLKTGKYAKKRSHTNDVKQLTEVVQKVATESIVIWGKTPKFRLP IQKET
WETWMEYQATWIPWEFVNTPPLVLKWLWYQLEKEPIAGAEFYVDGAANRETKLGKAGYVTDGRQKVVSLETETTNQKTELHAIHLAQDS
GSEVNI VTD SQYALGIIQAQPD RSESELVNOIEK LIEKEKVYLSWVPAHKGIGGNEQVDKLVSSGIRKVLFLDGDIDKAQEEHEKYHSNWRA
MASDFNLPPIVAKEIVASCDCQLKGEAMHGQVDCSPGIWQLDCTHLEKVLVAVHVASGYIEAEVIPAETGQETAYFLLKLAGRWPVKVV
HTDNGSNFTSAAVKAACWWANIQQEFGIPYNPQSQGVVESMNKELKKIIGQVREQAEHLKTA VQMAVFIHNEKRKGGIGGYSAGERIIDIIA
TDIQTKELOKQITKIQNFVRVYRDSRDP IWKGP AKLLWKGE GAVVIQDN SDIKVVP RRKAKIIRDYGKQ MAGDDC VAGRQDED\$

Fig. 110A

65. 2003 CON A2 pol. PEP

FFRENLA^QQREAR^ESE^QNRANSPTSRELNRNGRDNLSLSEAGAE^QQTVHSCNFPQITLWQRPLVTVKIEGQLREALLDTGADDTVLEDI
 NLPGRWKPKMIGGIGGFIKVRQYDQIAIEICGKRAIGTVLPGTPVNIIGRNMLVLGCTLNFPISPIETVPVKLPGMDGPKVKQWPLTEE
 KIKALTEICKEMEKEGKISKIGPENPYNTPVFAIKKDKSTKWRKLVDFRELNRKTQDFWEVQLGIPHPAGLKKKKS^VTVLDVGDAYFSVPLH
 EDFRKYTAFTIP^SINNETPGIRYQYNNVLPQGWKGS^{PAI}FQSSMTKILEPFRSKNPEMVIYQYMD^{DL}YVGS^{DL}EIGQHRAKIEELRAHLLRWG
 FTT^{PD}KKH^QKEPPFLWMGYELHPDKWTVQPIKLEKDSWTVNDIQKLVGKLNWASQIYAGIKVKQLCKLLRGTKALTDIVTLTKEAELELEE
 NREILKNPVHGVYDPSKDLIAEIQKQGDQWTYQIYQEPFKNLKTGKYAKRKSTHTNDVKQLTEAVQKIAIESIVIWGKTPK^{FR}LPIQKET
 WETWTEY^WQATWIP^EWEFVNT^{PP}LVKLWYQLETEPIAGAE^{TF}YVDGAANRET^{KL}GAGYVTD^{RG}RQKIVSLTET^{TN}QKTELHAIYALQDS
 GLEVNIVTDSQYALGIIQAQ^{PD}RSESELVNQII^EKLIEKERVYLSWVPAHKGIGNEQVDKLVSSGIRKVLFLDGDIDKAQEEH^{ERY}HSNWRA
 MAHDFNLPPIVAKEIVASC^{DK}QKLG^{EA}MHGQVDCSPGIWQ^{LD}CTHLEGVILVAVHVASGYIEAEVIPAETGQETAYFILKLAGRWPVKVI
 HTDNGSNFTSATVKAACW^{AG}VQ^QEFGIPYNPQSQGVV^{ES}MN^{KEL}KKIIQGVRDQAEHLKTA^{VQ}MAVFIH^NFKRKGIGGYSAGERIIDIIA
 TDIQTKELQ^QITKIQNFRVY^{YR}DSRDP^WKGPAKLLWKGE^{AV}VIQ^{DN}SDIKV^VPRR^{KAKI}IRDY^{GK}Q^{MA}GDDC^VAGRQ^{DE}D\$

Fig. 111A

66. 2003 CON B pol. PEP

FFREDLA^QQKARE^FSE^QTRANSPT^{RR}RELQVWGRDNLSLSEAGADRQGT^{VS}FSFPQITLWQRPLVTIKIGQLKEALLDTGADDTVLEEM
 NLPGRWKPKMIGGIGGFIKVRQYDQIILIEICGHKAIGTVLPGTPVNIIGRNLLTQIGCTLNFPISPIETVPVKLPGMDGPKVKQWPLTEE
 KIKALVEICTEMEKEGKISKIGPENPYNTPVFAIKKDKSTKWRKLVDFRELNRKTQDFWEVQLGIPHPAGLKKKKS^VTVLDVGDAYFSVPLD
 KDFRKYTAFTIP^SINNETPGIRYQYNNVLPQGWKGS^{PAI}FQSSMTKILEPFRKQNPDI^{VI}YQYMD^{DL}YVGS^{DL}EIGQHRTKIEELRQHLLRWG
 FTT^{PD}KKH^QKEPPFLWMGYELHPDKWTVQPIVLPEKDSWTVNDIQKLVGKLNWASQIYAGIKVKQLCKLLRGTKALTEVIPLTEAEAELELAE
 NREILKEPVHGVYDPSKDLIAEIQKQGDQWTYQIYQEPFKNLKTGKYARMRG^{AHT}NDVKQLTEAVQKIAATESIVIWGKTPK^{FR}LPIQKET
 WEA^WTEY^WQATWIP^EWEFVNT^{PP}LVKLWYQLEKEPIVGAET^{FY}VDGAANRET^{KL}GAGYVTD^{RG}RQKVVSLTDT^{TN}QKTELQAIHLALQDS
 GLEVNIVTDSQYALGIIQAQ^{PD}KSESELVSQII^EQLIKKEKVYLA^WVP^{PA}HKGIGNEQVDKLV^SAGIRKVLFLDGDIDKAQEEH^{ERY}HSNWRA
 MASDFNLPPVVAKEIVASC^{DK}QKLG^{EA}MHGQVDCSPGIWQ^{LD}CTHLEGGII^LVAVHVASGYIEAEVIPAETGQETAYFLLKLAGRWPVKTI
 HTDNGSNFTSTTVKAACW^{AG}IKQ^EFGIPYNPQSQGVV^{ES}MN^{KEL}KKIIQGVRDQAEHLKTA^{VQ}MAVFIH^NFKRKGIGGYSAGERIVDIIA
 TDIQTKELQ^QITKIQNFRVY^{YR}DSRDP^WKGPAKLLWKGE^{AV}VIQ^{DN}SDIKV^VPRR^{KAKI}IRDY^{GK}Q^{MA}GDDC^VAGRQ^{DE}D\$

Fig. 111B

2003_CON_B pol. OPT

TTCTTCGGCAGGACCTGGCCTTCCCCCAGGGCAAGGCCCGGAGTTCTCTCCGAGCAGACCCGGGCCAACTCCCCACCCGCCGGAGCTGCAGGTGTG
GGCGCGGACAAACAACCTCCCTGTCCGAGGCCGGCGCCGACCGCAGGGCACCGTGTCTCTCTCTCCCTCCCGCAGATCACCTGTGGCAGGCCCTCCCTGGTGA
CCATCAAGATCGCGCGGCTGCTGAGAGGCGCTGCTGAGACACCGCGCCGACGACACCGTGTGGAGGAGATGAACCTGCCCGGCCGCTGGAAGCCCAAG
ATGATCGCGCGGCTGCTGAGAGTGGCGGCTGCTGAGACACCGCGCCGACGACACCGTGTGGAGATCTGCGGCCACAAGGCCATCGGCACCGTGTGGTGGGCCC
CACCCCGTGAACATCATCGCGCGGCAACCTGCTGACCCAGATCGGCTGACCCCTGAACCTCCCATCTCCCATCGAGACCGTGGCCGTAAGCTGAAGC
CCGGCATGGACGGCCCCAAGGTGAAGCAGTGGCCCCCTGACCGAGGAGAAAGATCAAGGCCCTGTTGGAGATCTGCACCGAGATGGAGAAAGGAGGCAAGATC
TCCAAGATCGGGCCCCGAGAACCCCTACAACACCCCGCTGTTGCGCATCAAGAAGAAGGACTCCACCAAGTGGCGCAAGCTGGTGGACTTCCGCGAGCTGAA
CAAGCGCACCCAGGACTTCTGGGAGGTGACGTGGGCATCCCCCACCCTGAGAGAGCTGAAGAAGAAGTCCGTGACCGTGTGGACGTGGCGGACCGCCT
ACTTCTCCGTGCCCTGGACAAGGACTTCCGCAAGTACACCGCCCTTCAACATCCCTCCATCAACAACGAGACCCCGGCATCCGCTACCAGTACAACGCTG
CTGCCCCAGGGCTGGAAGGCTCCCCCGCATCTTCCAGTCTCCATGACCAAGATCTTGAGCCCTTCCGCAAGCAGAACCCCGACATCGTGTATCTACCA
GTACATGGACGACCTGTACGTGGCTCCGACCTGGAGATCGGCCAGCACCGACCAAGATCGAGGAGTGGCGCAGCACCTGTGCGCTGGGGCTTCACCA
CCCCGACAAGAAGCACCAAGAGGCCCTTCTGTGGATGGGTACGAGCTGACCCCGACAAAGTGGACCGTGCAGCCCATCGTGTGCCCGAGAAAG
GACTCTGGACCGTGAACGACATCCAGAAGCTGGTGGCAAGTGAACCTGGGCTCCAGATCTACGCGCGCATCAAGGTGAAGCAGCTGTGCAAGCTGCT
GGCGGCACCAAGGCCCTGACCGAGGTGATCCCCCTGACCGAGGAGCGGAGCTGGAGCTGGCGGAAACCGCGAGATCTCTGAAGGAGCCCGTGCACGCG
TGTACTACGACCCCTCCAAGACCTGATCGCGGAGATCCAGAAGCAGGCGCAGGCGGCTGACCTACCATGATCTACAGGAGCCCTTCAAGAACCTGAAG
ACCGGCAAGTACGCGCGCATGCGCGGCGCCACACCAACGACGTGAAGCAGCTGACCGAGCGCTGCAGAAAGATCGCCACCGAGTCCATCGTGTATCTGGGG
CAAGACCCCAAGTCAAGCTGCCCATCCAGAAGGAGACCTGGGAGGCTGTGGACCGAGTACTGGCAGGCCACCTGGATCCCGAGTGGGAGTTCGTGA
ACACCCCCCTGTTGAAGCTGTGTACAGCTGGAGAGGAGGCCCATCGTGGCGCGCGAGACCTTCTACGTGGAGCGCGCCCAACCGCGAGACCAAG
CTGGGCAAGGCCCGCTACGTGACCGACCGCGCCGAGAGGTGGTGTCCCTGACCGACACCAACCAAGAGACCGAGCTGCAGGCCATCCACCTGGC
CCTGAGGACTCCGGCTGGAGGTGAACATCGTGAACCGACTCCAGTACGCGCTGGGCATCATCCAGGCCAGCGCCGACAAGTCCGAGTCCGAGCTGGTGT
CCGAGATCATCGAGCAGCTGATCAAGAAGGAGAGGTGTACCTGGCTGGGTGCCGCCCAAGGGCATCGCGCGCAACGAGCAGGTGGACAAGCTGGTG
TCCGCCGGCATCCGCAAGGTGTCTTGGACGGCATCGACAAGGCCAGGAGGACGAGAGTACCACTCCAACCTGGCGGCCATGGCTCCGACTT
CAACCTGCCCCCGTGGTGGCCAAAGGATCGTGGCCCTCTGCGACAAGTGCAGCTGAAGGGGAGGCCATGCAAGGCCAGGTGGACTGCTCCCCCGGCA
TCTGGCAGCTGGACTGCACCCACCTGGAGGGCAAGATCATCTGTGTGGCCGTGCACGTGGCTTCCGGTACATCGAGGCCGAGGTGATCCCCGCCGAGACC
GGCCAGGAGACCGCTACTTCTGTGAAGCTGGCGGCGCTGGCCCGTGAAGACCATCCACACCGACAACGGCTCAAACTTCACCTCCACCAACCGTGAA
GGCGCTGTGTGGGCGGCGCATCAAGCAGGAGTTCGGCATCCCCCTACAACCCCTGCTCCAGGGCGTGGTGGAGTCCATGAACAAGGAGCTGAAGAGA
TCATCGGCCAGGTGGCGGACCAAGCCGAGACCTGAAGACCGCGCTGCAGATGGCGGTGTTCATCCACAACCTTCAAGCGCAAGGGCGGCTCGCGGGCTAC
TCCGCCGGGAGCGCATCGTGGACATCATCGCACCGGACATCCAGACCAAGGAGCTGCAGAAGCAGATCACCAAGATCCAGAAGCTTCCGCGTGTACTACCG
CGACTCCCGCGGACCCCTGTGGAGGGCCCCGCAAGCTGTGTGGAGGGCGGCGGCTGGTGTATCCAGGACAACTCCGACATCAAGGTGGTGGCCCC
GGCGAAGGCCAAGATCATCCGGGACTACGGCAAGCAGATGGCGCGCGACGACTGCGTGGCTTCCCGCCAGGACGAGGACTAA

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Fig. 111C

67. 2003 B.anc pol. PEP

FFRENLAFFQ GKAREFSSEQTRANSPTRRELQVWGRDNNPLSEAGADRQGTVSFPQITLWQRPLVTIKIGQLKEALLDTGADDTVLEEM
NLP GKWKPKMIGGIGGFIKVRQYDQILIEICGHKAIGTVLVGPTPVNIIGRNLLTQIGCTLNFPISPIETVPVKLKP GMDGPKVKQWPLTEE
KIKALVEICTEMEKEGKISKIGPENPYNTPVFAIKKKDSTKWRKLVDFRELNKRQTQDFWEVQLGIPHPAGLKKKKSVTVL DVGDAYFSVPLD
KDFRKYTAFTIP SINNETPGIRYQYNVLPQGWKGS PAIFQSSMTKILEPFRKQNP EIVYQYMDDLVVGSDLEIGQHRTKIEELREHLLRWG
FTTPDKKHQKEPPFLWMGYELHPDKWTVQPIVLPEKDSWTVNDIQKLVGKLNWASQIYAGIKVKQLCKLLRGTKALTEVVPLTEEAEELELAE
NREILKEPVHGVYDPSKDLIAEIQKQGQGWTYQIYQEPFKNLKTGKYARMRGHTNDVKQLTEAVQKIATESI VIWGT PKFKLPIQKET
WEAWTEYWQATWIP EWEFVNT PPLVKLWYQLEKEPIVGAETFYVDGAANRET KLGKAGYVTDGRQKVVS LTTDTNQKT ELQAIHLALQDS
GLEVNIVTDSQYALGI IQA QPKSESELVSQIIEQLIKKEKVYLAWP AHKGIGGNEQVDKLV SAGIRKVLFDGIDKAQEEHEKYHSNWRA
MASDENLPPVVAKEIVASCDKQKGEAMHGQVDCSPGIWQLDCTHLEGKIILVAVHVASGYIEAEVIP AETGQETAYFILLAGRWPVKVI
HTDNGSNFTSTTVKAAACWWAGIKQEF GIPYNPQSQGVVESMNKELKKIIGQVRDQAEHLKTA VQMAVFIHNEKRRKGGIGGYSAGERIVDIIA
TDIQTKELOKQITKIQNFRVYYRDSRDP LWKGP AKLLWKGE GAVVIQD NSDIKVVP RRKAKIIRDY GKQ MAGDDC VASRQDED\$

Fig. 111D

2003_B.anc pol.1.OPT

TTCTTCGGGAGAACCTGGCCCTTCCCCAGGGCAAGGCGCGGAGTTCTCTCCGAGCAGACCCCGGCCAACTCCCCACCCCGCGGAGCTGCAGGTGTG
 GGGCGCGACAAACCCCTGTCCGAGGCGCGGCGGACCGCAGGGCACCGTGTCCTTCTCTTCCCCCAGATCACCTGTGGCAGCGCCCTTGGTGA
 CCATCAAGATCGGCGGCGAGTGAAGGAGGCCCTGTGGACACCGGCGCGACACCGTGCTGGAGGAGATGAACCTGCCCCGCAAGTGAAGCCCCAAG
 ATGATCGGCGGCATCGGCGGCTTCATCAAGTGGCCAGTACGACAGATCCTGATCGAGATCTGGGCCACAAGCCATCGGCACCGTGTGGGGCCC
 CACCCCGTGAACATCATCGGCGCAACCTGCTGACCCAGATCGGCTGACCCCTGAACCTTCCCCATCTCCCCATCGAGACCGTGGCCGTGAAGTGAAGC
 CCGCATGGACGGCCCCAAGTGAAGCAGTGGCCCTGACCGAGGAGAGATCAAGGCCCTGGTGGAGATCTGCACCGAGATGGAGAGGAGGCAAGATC
 TCCAAGATCGGCGCGGAGAACCCCTACAACACCCCGTGTTCGCCATCAAGAGAGGACTCCACCAAGTGGCGCAAGCTGGTGGACTTCCGCGAGCTGAA
 CAAGCGCACCCAGGACTTCTGGAGGTGCAGCTGGGCATCCCCACCCCGCGCTGAAGAAGAGAGTCCGTGACCCGTGCTGGACGCTGGGGGACGCTT
 ACTTCTCCGTGCCCCCTGGACAAGGACTTCCGCAAGTACACCGCTTACCCATCCCCCTCCATCAACAACGAGACCCCGCATCCGCTACCACTACAACGTG
 CTGCCCCAGGGCTGGAAGGGCTCCCCCGCCATCTTCCAGTCTCCATGACCAAGATCCTGGAGCCCTTCCGCAAGCAGAACCCCGAGATCGTGATCTACCA
 GTACATGGACGACCTGTACGTGGCTCCGACCTGGAGATCGGCCAGCACCGCACCAAGATCGAGGAGCTGCGCGAGCACTGCTGCGCTGGGGCTTCACCA
 CCCCCACAAGAAGCACCAAGAGGAGCCCCCTTCTGTGGATGGCTACGAGCTGCACCCCGACAAGTGGACCGTGCAGCCCATCGTGTGCCCCGAGAAG
 GACTCTGGACCGTGAACGACATCCAGAAGCTGGTGGCAAGCTGAATGGGCCCTCCAGATCTACGCCGGCATCAAGTGAAGCAGCTGTGCAAGCTGCT
 GCGCGCACCAAGGCCCTGACCGAGGTGGTGGCCCTGACCGAGGAGGCGGAGCTGGAGCTGGCCGAGAACCGCGAGATCTTGAAGGAGCCCCGTGCACGGCG
 TGTACTACGACCCCTCAAGGACCTGATCGCGGAGATCCAGAAGCAGGGCCAGGCCAGTGGACCTTACAGATCTACAGGAGCCCTTCAAGAACCTGAAG
 ACCGGCAAGTACGCGCGGCGCCACACCAACGACGTGAAGCAGTGAACGAGTGAACGAGTGAACGAGTGAACGAGTGAACGAGTGAACGAGTGAACGAG
 CAAGACCCCAAGTCAAGTGGCCATCCAGAAGGAGACCTGGGAGGCTGGTGGACCGAGTACTGGCAGGCCACCTGGATCCCCGAGTGGGAGTTCGTGA
 ACACCCCCCTGGTGAAGCTGTGGTACCAGCTGGAGAAGGAGCCCATCGTGGCGCGGAGACCTTCTACGTGGACGGCGGCCCAACCGCGAGACCAAG
 CTGGGCAAGGCGCGCTACGTGACCGACCGCGCGCGCCAGAAAGTGGTGTCCCTGACCGACACCAACCAAGAGACCGAGCTGCAGGCCATCCACCTGGC
 CCTGCAGGACTCCGGCTGGAGGTGAACATCGTGACCGACTCCAGTACGCCCTGGGCATCATCCAGGCCAGCCCCGACAAGTCCGAGTCCGAGCTGGTGT
 CCCAGATCATCGAGCAGCTGATCAAGAAGGAGAGGTGTACCTGGCTGGTGCCGCCCAAGGGCATCGGCGGCAACGAGCAGGTGGACAAGCTGGTG
 TCCGCGGCGCATCCGCAAGGTGTGTCTTGACGCGCATCGACAAGGCCCCAGGAGGAGCACGAGAAGTACCACCTCCAACCTGGCGGCCATGGCCTCCGACTT
 CAACCTGCCCCCGTGGCCAGGAGATCGTGGCCCTCTCGGACAAGTGCAGCTGAAGGGCGAGGCCATGCACGGCCAGGTGGACTGCTCCCCCGGCA
 TCTGGCAGCTGGACTGCACCCACCTGGAGGGCAAGATCATCTGTGGCTGGACGTGGCCCTCCGCTACATCGAGGCCGAGGTGATCCCCCGCGGAGACC
 GGCCAGGAGACCGCTACTTTCATCTGAGAGTGGCGCGCTGGCCCGTGAAGGTGATCCACACCGACACCGGTCCAACCTCACTCCACCCACCGTGAA
 GGGCGCTGTGTGGCGCGCATCAAGCAGGAGTTCGGCATCCCCCTACAACCCCACTCCAGGGCGTGGTGGAGTCCATGAACAAGGAGCTGAAGAAGA
 TCATCGGCCAGGTGGCGGACCACTGAAGACCGCGCTGCAGATGGCGGTGTTCTATCCACAACCTTCAAGCGCAAGGGCGGATCGGGGGCTAC
 TCCGCGCGGAGCGCATCGTGGACATCATGCGCACCGACATCCAGACCAAGGAGCTGCAGAAGCAGATCACCAAGATCCAGAACCTTCCGCGGTGTACTACCG
 CGACTCCCGCGACCCCTGTGGAAGGGCCCCCGCAAGCTGTGTGAAGGGCGGAGGGCGCGGTGTGTATCCAGGACAACTCCGACATCAAGGTGTGTGCCCC
 GCGCAAGGCCAAGATCATCCGCGACTACGGCAAGCAGATGGCGGGCGACGACTGGCTGGCCCTCCCGCCAGGACGAGGACTAA

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Fig. 112A

68. 2003 CON C pol. PEP

FFRENLAFFPQGEAREFPSEQTRANSPTSRELQVRGDNPRSEAGAEQGTILNFPQITLWQRPLVSIKVGGOIKEALLDTGADDTVLEEINLPG
KWKPCKMIGGIGGFIVKVRQYDQILIEICGKKAIGTVLVGPTPVNIIGRNMLTQLGCTLNFPIETVPVKLKPMDGPKVKQWPLTEEEKIKA
LTAICEEMEKEGKITKIGPENPYNTPVEAIKKKDKSTKWRKLVDFRELNKRRTQDFWEVQLGIPHPAGLKKKSVTVLVDVGDAYFSVPLDEGFR
KYTAFTIPSIINNETPGIRYQYNNVLPQGWKGSPIQFSSMTKILEPFRAQNPETIYQYMDLTVGSDELIGQHRAKIEELREHLLKWGFTTP
DKKHQKEPPFLWMGYELHPDKWTVQPIQLPEKDSWTVNDIQKLVGKLNWASQIYPGIVKVRQCKLLRGAKALTDIVPLTEEAELAELENREI
LKEPVHGVYDPSKDLIAEIQKQGHQDQWTYQIYQEPFKNLKTGKYAKMRTAHTNDVKQLTEAVQKIAMESIIVWGKTPKFRLPQKETWETW
WTDYWQATWIPWEFVNTPPLVKLWYQLEKEPIAGAETFYVDGAANRETGKIGAGYVTDGRQKIVSLTETTNQKTELQAIQLALQDSGSEV
NIVTDSQYALGIIQAQPKSESELVNIIEQLIKKERVYLSWVPAHKGIGGNEQVDKLVSSGIRKVLFLDGDIDKAQEEHEKYHSNWRAMASE
FNLPIVAKETIVASCDCQKLGAEIHGOVDCSPGIWQDCTHLEGIILVAVHVASGYIEAEVI PAETGQETAYIILKLAGRWPVKVIHTDN
GSNFTSAAVKAACWWAGIQQEFGIPYNPQSQGVVESMNKELKKIIGQVRDQAEHLKTAVQMAVFIHNFKRKGGIGGYSAGERIIDIIATDIQ
TKELQKQIIKIQNFRVYRDSRDP IWKGPAKLLWKGEAVVIQDNSDIKVVP RRKAKIIKDYGKQMGAGADCVAGRQDED\$

Fig. 112B

2003_con_c pol.1.OPT

TTCTTCGGGAGAACCTGGCCCTTCCCCAGGGCGAGGCCCGGAGTTCCCTCCGAGCAGACCCCGGCCAACTCCCCACCTCCCGGAGCTGCAGGTGCG
CGGCGAACACCCCGCTCCGAGCGCGCGGAGCGCCAGGCGACCTGAACTTCCCCAGATCACCTGTGGCAGCGCCCTTGTGTCCATCAAGGTGG
GCGGCCAGATCAAGGAGGCCCTGCTGGACACCGGCGCGGACGACACCGTGTGGAGGAGATCAACCTGCCCGGCAAGTGAAGCCCAAGATGATCGGCGGC
ATCGGCGGCTTCATCAAGGTGCGGCCAGTACGACCATCTGTATGAGATCTGGGCAAGAGGCCATCGGCACCGTGTGGTGGCCCCACCCCCGTGAA
CATCATCGGCGCAACATGCTGACCCAGCTGGGCTGCACCTGAACTTCCCCATCTCCCCATCGAGACCGTGTGAACTGAAGCTGAAGCCCGCATGGACG
GCCCCAAGGTGAAGCAGTGGCCCTGACCGAGGAGAAAGATCAAGGCCCTGACCGCATCTGCGAGGAGATGGAGAGGAGGCAAGATCACCAAGATCGGC
CCCGAGAACCCCTACAACACCCCGTGTTCGCCATCAAGAAGAAGGACTCACCAAGTGGCGCAAGCTGGTGGACTTCCCGGAGCTGAACAAGCGCACCCCA
GGACTTCTGGGAGGTGCAGCTGGGATCCCCCACCCCGCGGCTGAAGAAGAAGTCCGTGACCGTGTGGACGTGGGCGACGCCCTACTTCTCCGTGC
CCCTGGACGAGGGCTTCCGCAAGTACACCGCTTACCATCCCTCCATCAACAAGAGACCCCGGCATCCGCTACAGTACAAACGTGTGCCCGCAGGGC
TGGAAGGGCTCCCCCGCATCTTCCAGTCTCCATGACCAAGATCTTGAGCCCTTCCGCGCCAGAACCCCGAGATCGTGATCTACCAGTACATGGACGA
CCTGTACGTGGCTCCGACCTGGAGATCGGCAGCACCGCGCCCAAGATCGAGGAGCTGCGCGAGCACCTGTGTAAGTGGGCTTCACCAACCCCGCACAGA
AGCACAGAGGAGCCCCCTTCTGTGGATGGGTACGAGCTGACCCCGACAAAGTGGACCGTGCAGCCCATCCAGCTGCCGAGAGGACTCCTGGACC
GTGAACGACATCCAGAAGCTGGTGGCAAGCTGAATCTGGGCTCCAGATCTACCCGGCATCAAGGTGGCGCAGCTGTGCAAGCTGTGCGGCGGCGCCAA
GGCCCTGACCGACATCGTGTCCCTGACCGAGGAGGCGGAGCTGGAGCTGGCCGAGAACCGCGAGATCTCTGAAGGAGCCCGTGACGGCGTGTACTACGACC
CCTCCAAGGACCTGATCGCCGAGATCCAGAAGCAGGGCCACGACCATGAGCTTACAGATCTACCAAGAGCCCTCAAGAACCTGAAGACCGGCAAGTAC
GCCAAGATGGCACCGCCACACCAAGCAGTGAAGCAGCTGAACGAGGCGTGCAGAAGATCGCCATGGAGTCCATCGTGATCTGGGGCAAGACCCCCAA
GTTCCGCTGCCCATCCAGAAGGAGACCTGGGAGACCTGGTGGACCGACTACTGGCAGGCCACCTGGATCCCCAGTGGGAGTTCGTGAACACCCCCCCC
TGGTGAAGCTGTGTACAGCTGGAGAAGGAGGCCCATCGCCGGCGCCGAGACCTTCTACGTGGACGGCGCGCCCAACCGCGAGACCAAGATCGGCAAGGCC
GGCTACGTGACCGCGCGCGCCAGAGATCGTGTCTCTGACCGAGACCAACCAAGAGACCGAGCTGCAGGCCATCCAGCTGGCCCTGCAGGACTC
CGGCTCCGAGGTGAACATCGTGACCGACTCCCACTACGCCCTGGGCATCATCCAGGCCAGCCCCGACAAAGTCCGAGTCCGAGCTGGTGAACCATCATCG
AGCAGCTGATCAAGAAGGAGCGGTGTACTGTCTCTGGTGCCTGCCCAAGGGCATCGGGCGCAACGAGCAGGTGGACAAGCTGGTCTCTCCGGCATC
CGCAAGGTGCTGTCTTGACGGCATCGACAAGGCCCGAGGAGGAGCAGAGAAAGTACCACTCCAACCTGGCGGCCCATGGCTCCGAGTCAACCTGCCCTCC
CATCGTGGCCCAAGGAGATCGTGGCTCTCTGGACAAAGTGGCCAGCTGAAGGGCGAGGCCATCCACGGCCAGGTGGACTGTCCCCCGGCATCTGGCAGCTGG
ACTGCAACCCACCTGGAGGGCAAGATCATCTGTGTGGCGGTGCAGTGGCTCCGGCTACATCGAGGGCCGAGGTGATCCCCCGGAGACCGGCCAGGAGACC
GCCTACTACATCTGAAGCTGGCGCGGTGGCCGTGAAGGTGATCCACACCGACAAAGGCTCCAACCTTCACTCCGCGCGCTGAAGCGCGCTGTG
GTGGCGCGGCATCCAGCAGGAGTTCGGCATCCCTACAACCCCGCAGTCCAGGGCTGTGGAGTCCATGAACAAGGAGCTGAAGAAGATCATCGGCCAGG
TGCGCGGACCCAGGCGGACCTGAAGACCGCGGTGCAGATGGCGGTGTTTCATCCACAACCTCAAGCGCAAGGGCGGATCGGCGGCTACTCCGCGCGCGGAG
CGCATCATCGACATCATCGCCACCGACATCCAGACCAAGGAGCTGCAGAAGCAGATCATCAAGATCCAGAATCTCCGCTGTACTACCGGACTCCCGCGA
CCCCATCTGGAAGGGCCCCCAAGCTGTGTGAAGGGCGAGGGCGCGTGTGATCCAGGACAACTCCGACATCAAGGTGGTGGTCCCCCGCGCAAGGCCA
AGATCATCAAGGACTACGGCAAGCAGATGGCCCGCGCGCACTGCGTGGCGCGCCCGCAGGACGAGGACTAA

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Fig. 112C

69. 2003 C.anc pol.PEP

FFRENLAFFQGEAREFPSEQTRANSPTSRELQVGRDNPRSEAGAERQGTLLNFPQITLWQRPVLSIKVGGQIKEALLDTGADDTVLEEINL
PGKWKPKMIGGIGGFVKVRQYDQILLIEICGKKAIGTVLVGPTPVNIIGRNMLTQLGCTLNFPIETVPVKLPGMDGPKVKQWPLTEEKI
KALTAICEEMEKEGKITKIGPENPYNTPVFAIKKDKSTKWRKLVDFRELNKRTOQDFEWQVQLGIPHPAGLKKKSVTVLDVGDAYFSVPLDEG
FRKYTAFTIPSIINNETPGIRYQYNVLPQGWKGSIPAIFQSSMTKILEPFRQNPFIYQYMDLTVGSDLEIGQHRAKIEELREHLLKKGFT
TPDKKHQKEPPFLWMGYELHPDKWTVQPIQLPEKDSWTVNDIQKLVGKLNWASQIYPGKVRQLCKLLRGAKALTDIVPLTEEAEELELAENR
EILKEPVHGVYDPSKDLIAEIQKQHDQWYQIYQEPFNKLTGKYAKMRTAHTNDVKQLTEAVQKIAMESIIVGWKTPKFRLPKIQKETWE
TWWTDYWQATWIPWEFEVNTPPPLVKLWYQLEKEPIAGAEFYVDGAANRETKIGKAGYVTDGRQKIVSLTETTNQKTELQAIQALQDSGS
EVNIVTDSQYALGIIQAQPKSESELVNQIIIEQLIKKEKYLWSVPAHKGIGGNEQVDKLVSSGIRKVLFLDGDIDKAQEEHEKYHSNWRAMA
SEFNLPPIVAKEIVASCDKQKGEAMHGQVDCSPGIWOLDCTHLEGKIILVAVHVASGYIEAEVIPAETGQETAYFILKLAGRWPVKVIHT
DNGSNFTSAAVKAACWWAGIQQEFGIYPNPQSGVVESEMNKELKIIIGQVRDQAEHLKTAVQMAVFIHNFRRKGGIGGYSAGERIIDIIATD
IQTKELQKQIIKIQNFRVYYRDSRDPWKGPAKLLWKGEAVVIQDNSDIKVVPRRKAKIIRDYGGKQMAQADCVAGRQDED\$.

Fig. 112D

2003 C.anc pol.OPT

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TTCTTCGGCGAGAACCTGGCCTTCCCCCAGGGCGAGGCCCGCGAGATTCCCCCTCCGAGCAGACCCGCGCCAACTCCACCTCCCGCGAGCTGCAGGTGGG
CCGGACAACCCCGCTCCGAGGCCGCGCGAGCGCCAGGACCCCTGACCCCTGAACCTTCCCCCAGATCACCTGTGGCAGCGCCCCCTGGTGTCCATCA
AGGTGGCGGCGCAGATCAAGGAGGCCCTGTGGACACCGGCGCGACACCGTGTGGAGGAGATCAACCTGCCCGCAAGTGAAGCCCAAGATGATC
GGCGGCATCGGCGGCTTCATCAAGGTGCGCCAGTACGACCAGATCCTGTATCGAGATCTGGGCAAGAAGGCCATCGGCACCGTGTGGTGGGCCACCC
CGTGAACATCATCGGCCGCAACATGCTGACCCAGCTGGGCTGACCCCTGAACCTTCCCCATCTCCCCATCGAGACCGTGCCTGTAAGCTGAAGCCCGGCA
TGGACGGCCCCAAGGTGAAGCAGTGGCCCTGACCGAGGAGAAAGATCAAGGCCCTGACCGCCATCTCGAGGAGATGGAGAAGGAGGGCAAGATCACCAAG
ATCGGCCCGAGAACCCCTACAAACACCCCGTGTTCGCCATCAAGAAGAAGGACTCCACCAAGTGGCGCAAGCTGGTGGACTTCCGCGAGCTGAACAAGCG
CACCCAGGACTTCTGGGAGGTGCAGCTGGGCATCCCCACCCCGCGGCTGAAGAAGAAGTCCGTGACCGTGTGGACGTGGCGGACGCCCTACTTCT
CCGTGCCCCCTGGACGAGGGCTTCCGCAAGTACACCGCTTCAACATCCCTCCATCAACAACGAGACCCCCGGCATCCGCTACCACTACAACGTGTGCC
CAGGGCTGAAGGGCTCCCCCGCCATCTTCCAGTCTCCATGACCAAGATCTTGGAGCCCTTCCGCGCCAGAACCCCGAGATCGTGATCTACCGATACAT
GGACGACCTGTACGTGGCTCCGACCTGGAGATCGCCAGACCGCGCCAAAGATCGAGGAGCTGCGCGAGCACCCTGCTGAAGTGGGGCTTCAACACCCCG
ACAAAGACACCAAGAGGCCCTTCTGTGGATGGCTACGAGCTGCAACCCGACAAGTGGACCGTGCAGCCCATCCAGCTGCCCGAGAAAGGACTCC
TGGACCGTGAACGACATCCAGAAGCTGGTGGGCAAGCTGAACCTGGGCTCCAGATCTACCCCGGCATCAAGGTGCGCAGCTGTGCAAGCTGTGCGCGG
CGCCAAAGGCCCTGACCGACATCGTGCCTTACCGAGGAGGCGGAGCTGGAGACCTTACTGGCAGGCCACCTGGATCCCGAGTGGGAGTTCGTGAACACCC
ACGACCCCTTCAAGGACCTGATCGCCGAGATCCAGAAGCAGGSCCAGCAGTGGACCTACCAGATCTACCGAGAGCCCTTCAAGAACCCTGAAGACCGGC
AAGTACGCCAAAGATGCGCACCGGCCACACCAACGACGTGAAGCAGTGAACGAGCCGTGCAGAAAGATCGCCATGGAGTCCATCGTGTGGGCAAGAC
CCCCAAGTTCGCTGCCATCCAGAAGGAGACCTGGGAGACCTGGTGGACCGACTACTGGCAGGCCACCTGGATCCCGAGTGGGAGTTCGTGAACACCC
CCCCCTGGTGAAGCTGTGTACAGCTGGAGAAGGAGCCCATCGCCGCGCGCGAGACCTTCTACGTGGACGGCGCCCAACCCGCGAGACCAAGATCGGC
AAGGCCGGCTACGTGACCGACCGCGCGCGCCAGAAGATCGTGTCCCTGACCGAGACCCCAACCAAGAACCGAGCTGCAGGCCATCCAGCTGGCCCTGCA
GGACTCCGGCTCCGAGGTGAACATCGTGACCGACTCCAGTACGCCCTGGGCAATCATCCAGGCCAGCCCGACAAGTCCGAGTCCGAGCTGGTGAACCCAGA
TCATCGAGCAGCTGATCAAGAAGGAGAAGGTGTACTGTCTTGGTGCCGCCACAAGGGCATCGGCGGCAACGAGCAGGTGGACAAGCTGGTGTCTCTCC
GGCATCCGCAAGGTGCTGTCTTGACGGCATCGACAAGGCCCAGGAGGACGAGAAAGTACCCTCAACTGGCGGCCATGGCCCTCCGAGTTCACCT
GCCCCCATCGTGGCCAAAGGAGATCGTGGCCCTCTCGACAAAGTGCACAAAGTGAAGGCCGAGGCCATGCACGGCCAGGTGGACTGCTCCCCCGGCATCTGGC
AGCTGGACTGCACCCACCTGGAGGGCAAGATCATCTGTGTGGCTGTCAGTGGCTCCGGCTACATCGAGGCCGAGGTGATCCCGCGAGACCGGCCAG
GAGACCGCCTACTTCATCTGAAGCTGGCCGCGCCGTGGCCCGTGAAGGTGATCCACAGCGACAACGGCTCCAACCTCACCTCCGCGCGCTGAAGGCCG
CTGTGTGGCGCGGCATCCAGCAGGAGTTCGGCATCCCCCTACAACCCCGAGTCCGAGGCCGTGGTGGAGTCCATGAACAAGGAGCTGAAGAAGATCATCG
GCCAGGTGCGCGACCAAGCCGAGCACCTGAAGACCGCCGTGCAGATGGCCGTGTTCATCCACAACCTCAAGCGCAAGGGCGGCATCGGCGCTACTCCGCC
GGCGAGCGCATCATCGACATCATCGCCACCGACATCCAGACCAAGGAGCTGCAGAAGCAGATCATCAAGATCCAGAACTTCCGCGTGTACTACCGCGACTC
CCGGACCCCATCTGGAAGGGCCCCCGCAAGCTGTGTGAAGGGCGAGGGCCCCGTGGTGTATCCAGGACAACCTCCGACATCAAGGTGGTGGCCCCGGCA
AGGCCAAGATCATCCGCGACTACGGCAAGCAGATGGCCGCGCGCGACTGCGTGGCGCGCGCCAGGACGAGGACTAA

Fig. 113A

70. 2003 CON D pol. pep

EFRENLAFFQKGAGELSSQTRANSPTSRELVRWGGDNPLSETGAERQGTVSFNFQITLWQRPVLTIKIGGQKKEALLDTGADDTVLEEIN
 LPGKWKPKMIGGIGGFIKVRQYDQILIEICGHKAIGTVLVGTPVNIIGRNLLTQIGCTLNFPISPIETVPVKLPGMDGPKVKQWPLTEEK
 IKALTEICTEMEKEGKISRIGPENPYNTPIFAIAKKKDKSTKWRKLVDFRELNKRQDFWEVQLGIPHPAGLKKKKSVTVDVGDAYFSVPLDE
 DFRKYTAFTIPINNTPGIRYQYNVLPQGWKGSFAIFQSSMTKILEPFRKQNPFIYQYMDLLYVGSDEIGQHRTKIEELREHLLRWGE
 TTPDKKHQKEPPFLWMGYELHPDKWTVPQIKLPEKESWTVNDIQKLVGKLNWASQIYPGKVRQLCKLLRGTKALTEVIPLTEEALELEAEN
 REILKEPVHGVYDPSKDLIAEIQKQGGQWTYQIYOEPFKNLKTGYARMRGHTNDVKQLTEAVQKIAIESIWIWGKTPKFRLPQKETW
 ETWTEYWOATWIPWEFEVNTPPVLVWLWYLEKEPIIGAETFYVDGAANRETCLGKAGYVTDGRQKVPLTDTTNQKTELQAINLALQDSG
 LEVNIIVTDSQYALGIIQAQPKSESELVSQIEQLIKKEKVYLAWVPAHKGIGGNEQVDKLVNSGIRKVLFLDGDIDKAOEHEKEYHNNWRAM
 ASDFNLPVVAKEIVASCDCQLKGEAMHGQVDCSPGIWQLDCTHLEGKVLVAVHVASGYIEAEVIPAETGQETAYFLLKLAGRWPVKVVH
 TDNGSNFTSAAVKAACWWAGIKQEFFGIPYNPQSQGVVESMNKELKKIIGQVRDQAEHLKTAVQMAVFIHNEKRRKGIGGYSAGERIIDIAT
 DIQTKELQKQIIKIQNFRVYRDSRDPIMKGPALLWKGEAVVIQDNSDIKVVPRRKVKIIRDYGMAGDDCVASRQDEDS

Fig. 114A

71. 2003 CON F1 pol. pep

EFRENLAFFQGEARKFPSEQTRANSPASRELVRQRGDNPLSEAGAERRGTVPSLSFPQITLWQRPVLTIKIGGQKKEALLDTGADDTVLEDI
 NLPGWKPKMIGGIGGFIKVKQYDHIIEICGHKAIGTVLVGTPVNIIGRNMLTQIGCTLNFPISPIETVPVKLPGMDGPKVKQWPLTEE
 KIKALTEICTEMEKEGKISKIGPENPYNTPVFAIAKKKDKSTKWRKLVDFRELNKRQDFWEVQLGIPHPAGLKKKKSVTVDVGDAYFSVPLD
 KDFRKYTAFTIPSVNNETPGIRYQYNVLPQGWKGSFAIFQCSMTKILEPFRKQNPDIYQYMDLLYVGSDEIGQHRTKIEELREHLLKWG
 FTTDPKKHQKEPPFLWMGYELHPDKWTVPQIQLPDKDSWTVNDIQKLVGKLNWASQIYPGKVRQLCKLLRGAKALTDIVPLTAEAELELAE
 NREILKEPVHGVYDPSKDLIAEIQKQGGQWTYQIYOEPFKNLKTGYAKMRSHTNDVKQLTEAVQKIALESIVIWGKTPKFRLPILKET
 WDTWTDYWOATWIPWEFEVNTPPVLVWLWYLEKEPIIGAETFYVDGASNRETCKKGAGYVTDGRQKVPLTDTTNQKAELOAIHLALQDS
 GSEVNIIVTDSQYALGIIQAQPKSESELVNQIEQLIKKEKVYLSWVPAHKGIGGNEQVDKLVSAIRKILFLDGDIDKAOEHEKEYHNNWRA
 MASDFNLPVVAKEIVASCDCQLKGEAMHGQVDCSPGIWQLDCTHLEGKILVAVHVASGYIEAEVIPAETGQETAYFLLKLAGRWPVKII
 HTDNGSNFTSAAVKAACWWAGIQQEFFGIPYNPQSQGVVESMNKELKKIIGQVRDQAEHLKTAVQMAVFIHNEKRRKGIGGYSAGERIIDI
 TDIQTRRELQKQITKIQNFRVYRDSRDPVWKGPALLWKGEAVVIQDNSEIKVVPRRKAKIIRDYGMAGDDCVAGRQDEDS

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Fig. 113B

2003_CON D pol:OPT

TTCTTCGGGAGAACCTGGCCCTTCCCCAGGGCAAGCCGGGAGCTGTCTCCGAGCAGACCCCGGCCAACTCCCCACCTCCCGCGAGCTGCGCGTGTG
GGGCGGCGACAAACCCCTGTCCGAGACCGGGCGCGAGCGCCAGGGACCGTGTCTTCAACTTCCCCAGATCACCTGTGGCAGCGCCCCCTGGTGACCA
TCAAGATCGGCGGCGAGCTGAAGGAGGCCCTGTGGACACCGACACCGTGTGGAGGAGATCAACCTGCCCCGCAAGTGAAGCCCAAGATG
ATCGGCGGCATCGGCGGCTTCAATCAAGGTGCGCCAGTACGACAGATCCTGTATCGAGATCTGCGGCCACAAGGCCATCGGCACCGTGTGGTGGCCCCAC
CCCCGTGAACATCATCGGCGCGCAACCTGTGACCCAGATCGGCTGCACCCCTGAACTTCCCCATCTCCCCATCGAGACCGTGGCCGTGAAGCTGAAGCCCG
GCATGGACGGCCCCAAGGTGAAGCAAGTGGCCCCCTGACCGAGGAGAAAGATCAAGGCCCTGACCCGAGATCTGCACCGAGATGGAGAGGAGGCAAGATCTCC
CGCATCGGCCCGGAGAACCCCTACAACACCCCCCATCTTCGCCATCAAGAGAAGGACTCCACCAAGTGGCGCAAGCTGGTGGACTTCCGCGAGCTGAACAA
GGCACCCAGGACTTCTGGGAGGTGCAGCTGGGCATCCCCACCCCGCGGCTGAAGAAGAAGTCCGTGACCTGCTGGACGTGGCGGACGCCCTACT
TCTCCGTGCCCCTGGACGAGGACTTCCGCAAGTACACCGCCTTACCATCCCCCTCCATCAACAAGAGACCCCGGCATCCGCTACCACTCAACGTGCTG
CCCCAGGGCTGAAGGGCTCCCCCGCCATCTTCCAGTCTCTCATGACCAAGATCCTGGAGCCCTTCCGCAAGCAGAACCCCGAGATCGTGTATCTACCAGTA
CATGGACGACCTGTACGTGGCTCCGACCTGGAGATCGGCCAGCACCGCACCAAGATCGAGGAGCTGCGGAGCACCTGCTGGCTGGGGCTTCAACACCC
CCGACAAGAAGCACAGAGGAGCCCCCTTCTGTGGATGGCTACGAGCTGACCCCGACAAGTGGACCGTGCAGCCCATCAAGCTGCCCGAGAGGAG
TCCTGGACCGTGAACGACATCCAGAAGCTGGTGGCAAGCTGAAGTGGGCTCCAGATCTACCCCGCATCAAGGTGGCGCAGCTGTGCAAGCTGTGCG
CGGACCAAGGCCCTGACCGAGGTGATCCCCCTGACCGAGGAGGCCGAGCTGGAGTGGCCGAGAACCGCGAGATCTTGAAGGAGCCCGTGCACGGCGTGT
ACTACGACCCCTCAAGSACCTGATCGCCGAGATCCAGAAGCAGGGCCAGGGCCAGTGGACCTACCAAGATCTACAGGAGCCCTTCAAGAACCTGAAGACC
GGCAAGTACGCCCGCATGCGCGGCGCCACACCAACGACGTGAAGCAGTACCGAGGCGCTGCAGAAGATCGCCATCGAGTCCATCTGTGATCTGGGGCAA
GACCCCAAGTTCCGCTGCCCATCCAGAAGGAGACCTGGGAGACCTGGTGGACCGAGTACTGGCAGGCCACCTGGATCCCCAGTGGGAGTTCTGTGAACA
CCCCCCCCCTGGTGAAGCTGTGTACCAAGCTGGAGAAGGAGCCCATCATCGGCCCGGAGACCTTCTACGTGGACGGCGCCGCAACCCGCGAGACCAAGCTG
GGCAAGGCCGGCTACGTGACCGACCGCGGCCGCGCAGAGGTGGTCCCCCTGACCGACACACCAACCAAGAGACCGAGCTGCAGGCCATCAACCTGGCCCT
GCAGGACTCCGGCTGGAGGTGAACATCGTGACCGACTCCAGTACGCCCTGGGCATCATCCAGGCCAGCCCGACAAGTCCGAGTCCGAGCTGGTGTCCC
AGATCATCGAGCAGTGATCAAGAAGGAGAGGTGTACCTGGCTGGTGCCCGCCACAAGGGCATCGGCGGCAACGAGCAGGTGGACAAAGTGGTGTCC
AAGGCATCCGCAAGTGTCTCTGGACGGCATCGACAAGGCCCAGGAGGAGCACGAGAAGTACCACAACAATGGCGGCGCATGGCCTCCGACTTCAA
CCTGCCCCCGGTGGCCAGGAGATCGTGGCTCTCTGCGACAAGTCCAGCTGAAGSGGAGGCCATGCACGGCCAGGTGGACTGCTCCCCCGGCATCT
GGCAGTGGACTGCACCCACCTGGAGGGCAAGGTGATCTGTGGTGGCTGACCTGGCTGCGCTACATCGAGGCGGAGGTGATCCCCCGCGAGACCGGC
CAGGAGACCGCCTACTTCTGTGTGAAGCTGGCCCGCGCTGGCCCGTGAAGTGTGTGACACCGACAACGGCTCCAACCTCACCTCCGCGCGCTGAAGGC
CGCTGCTGTGGCGGCGATCAAGCAGGAGTTCGGCATCCCCACCCCGCTGACAGTGGCGGCTGGTGGAGTCCATGAACAAGAGAGCTGAAGAAGATCA
TCGGCCAGGTGCGGACCGAGCCAGCACCTGAAGACCGCGTGCAGATGGCCGTGTTCATCCACAACCTTCAAGCGGAAGGCGGCGTACTCC
GCCGCGAGCGCATCATCGACATCATCGCCACCGACATCCAGACCAAGGAGCTGCAGAAGCAGATCATCAAGATCCAGAATTCGGGTGTACTACCGCGA
CTCCCCGACCCCATCTGGAAGGGCCCCCGCAAGCTGTGTGAAGGGCGGCGCTGTGTATCCAGGACAACCTCCGACATCAAGGTGGTGGTCCCCCGCC
GCAAGGTGAAGATCATCCCGGACTACGGCAAGCAGATGGCCCGGCGACGACTGCGTGGCTTCCCCCGCAGGACGAGGACTAA

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Fig. 115A

72. 2003 CON F2 pol. PEP

FFRENLAFOQGEAREFSSEQTRANSPASRELVRRGDNLPEAGAERQGTGSSLDFFQITLWQRPVLTIKVGGQALREALDGTGADDTVLEDI
 NLPKWKPKMIGGIGGFIKVRQYDQIPIEICGKAIGTVLVGPTPNIIGRNMLTQIGCTLNFPISPIETVPVKLPGMDGPKVKQWPLTEE
 KIKALTEICTEMEKEGKISKIGPENPYNTPVFAIKKDDSTKWRKLVDFRELNKRTQDFWEVQLGIPHPAGLKKKKSVTVLVDGDAYFSVPLD
 KEFRKYTAFTIPSTNNETPGIRYQYNVLPQGWKGSFAIFQSSMTKILEPFRKNPEIIVYQYMDDLVYGSDEIGQHRTKIEELREHLLRWG
 FTTDPKKHQKEPPFLWMGYELHPDKWTVQAIQLPDKSSWTVNDIQKLVGKLNWASQIYPGIRVKHLCKLGRGAKALTDVVPPLTAAEAELELAE
 NREILKEPVHGVYDPSKDLIAEIQKQHDQWTYQIYQEPHKNLKTGYARRKSAHTNDVKQTEVVQKIATGIVWGVKVPKFRPLPIQKET
 WEIWWTEYWQATWIPWEFEFVNTPLVLWYQLETEPIVGAETFYVDGAANRETKLGKAGYVTDGRQKVPLTETTNOQTELQAIHLALQDS
 GSEVNIIVTDSQYALGIIQAHPDKSESELVNQIIQLIKERVYLSWVPAHKGIGGNEQVDKLVSTGIRKVLFLDGDIDKAQEEHEKYHSNWR
 MASDENLPPVVAKEIVASCDCQKLGEMHGQVDCSPGIWQLDCTHLEGGKIILVAVHVASGYIEAEVIPAETGQETAYFILKLAGRWPVKII
 HTDNGSNFTSTVKAACWWAGIQEFGIPYNPQSQGVESMNKELKKIIGQVRDQAEHLKTAVMQAVFIHNFKRKGGIGGYSAGERIIDIIA
 TDIQTKELQKQITKIQNFRVYFRDSRDPVWKGPAPKLLWKGEAVVIQDNNEIKVVPRRKAKIIRDYKQMGAGDDCVAGRQDED\$

Fig. 116A

73. 2003 CON G pol. PEP

FFRENLAFOQGEAREFSSEQTRANSPTRRELVRRGDSPLPEAGAEGKGAISLSFPQITLWQRPVLTIKVGGQALREALDGTGADDTVLEIN
 LPGKWKPKMIGGIGGFIKVRQYDQIILIEISGKKAIGTVLVGPTPNIIGRNMLTQIGCTLNFPISPIETVPVKLPGMDGPKVKQWPLTEEK
 IKALTEICTEMEKEGKISKIGPENPYNTPVFAIKKDDSTKWRKLVDFRELNKRTQDFWEVQLGIPHPAGLKKKKSVTVLVDGDAYFSVPLDE
 NFRKYTAFTIPSTNNETPGIRYQYNVLPQGWKGSFAIFQSSMTKILEPFRKNPEIIVYQYMDDLVYGSDEIGQHRAKIEELREHLLRWG
 TTPDKKKHQKEPPFLWMGYELHPDKWTVQIQLPDKESWTVNDIQKLVGKLNWASQIYPGIRKVLCKLGRGAKALTDIVPLTAAEAELELAE
 REILKEPVHGVYDPSKELIAEVQKGLDQWTYQIYQEPYKNLKTGYAKRGAHTNDVKQTEVVQKIATESIVWIKTPKFKLPPIRKETW
 EVWWTEYWQATWIPWEFEFVNTPLVLWYRLTEPIPGAETYYVDGAANRETKLGKAGYVTDKQKQIITLTETTNOQAELOAIHLALQDSG
 SEVNIIVTDSQYALGIIQAQPDSESELVNQIIQLIKKEKVVLSWVPAHKGIGGNEQVDKLVSSGIRKVLFLDGDIDKAQEEHEKYHSNWRAM
 ASDFNLPPIVAKEIVASCDCQKLGEMHGQVDCSPGIWQLDCTHLEGGKIILVAVHVASGYIEAEVIPAETGQETAYFILKLAGRWPVKVIH
 TDNGSNFTSAVKAACWWANITQEFGIPYNPQSQGVESMNKELKKIIGQVRDQAEHLKTAVMQAVFIHNFKRKGGIGGYSAGERIIDIIAS
 DIQTKELQKQITKIQNFRVYFRDSRDPVWKGPAPKLLWKGEAVVIQDNNEIKVVPRRKAKIIRDYKQMGAGDDCVAGRQDED\$

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Fig. 115B

2003_CON_F2 pol.1.OPT

TTCTTCCGCGAGAACCTGGCCCTCCAGCAGGGCGAGGCCCGCAAGTTCTCTCCGAGCAGACCCGCGCCAACTCCCGCCCTCCCGCAGCTGCGCGTGGC
CCGCGCGACAACTCCCTGCCCGAGGCGCGCGCGAGCGCCAGGGCACCGGCTCTCTCTGGACTTCCCCAGATCACCTGTGGCAGCGCCCCCTGGTGA
CCATCAAGGTGGCGGCCAGCTGCGCGAGGCCCTGTGGACACCGGCGCCGACACACCGTGTGGAGGACATCAACCTGCCCCGGCAAGTGAAGCCCAAG
ATGATCGCGCGCATCGCGCGCTTTCATCAAGTGGCGCCAGTACGACACAGATCCCCATCGAGATCTGGCGCCAGAAAGGCCATCGGCACCGTGTGGTGGCCCC
CACCCCGTGAACATCATCGCGCGCAACATGTGACCCAGATCGGCTGCACCCCTGAACCTTCCCCATCTCCCCATCGAGACCGTGGCCGTGAAGCTGAAGC
CCGGCATGGACGGCCCCAAGTGAAGCAGTGGCCCCGTGACCGAGGAGAGATCAAGGCCCTGACCCGAGATCTGCACCGAGATGGAGAAGGAGGGCAAGATC
TCCAAGATCGGCCCCGAGAACCCCTACAACACCCCGTGTTCGCCATCAAGAAGAAGGACTCCACCAAGTGGCGAAGCTGGTGGACTTCCGCGAGCTGAA
CAAGCGACCCAGGACTTCTGGGAGGTGAGCTGGGCATCCCCACCCCGCGGCTGAAGAAGAAGTCCGTGACCGTGTGGACGTGGCGGACGCCT
ACTTCTCCGTGCCCTGGACAAGGAGTCCGCAAGTACACCGCCTTCACTCCCTCCATCAACAACGAGACCCCGGCATCCGCTACCGTACCAACGTTG
CTGCCCCAGGGCTGGAAGGCTCCCCCGCATCTTCCAGTCTCCATGACCAAGATCTTGAGCCCTTCCGCGCCAAAGAACCCCGAGATCGTGATCTACCA
GTACATGGACGACCTGTACGTGGGCTCCGACCTGGAGATCGGCCAGCACCGCAACCAAGATCGAGGAGCTGCGGAGACCTGTGCGCTGGGCTTCACCA
CCCCGACAAGAAGCACAGAGGAGCCCCCTTCTGTGGATGGGTACGAGTGCACCCCGACAAGTGGACCGTGCAGGCCATCCAGCTGCCCGACAAG
TCCTCTGGACCGTGAACGACATCCAGAAGCTGGTGGCAAGCTGAACCTGGGCTCCAGATCTACCCCGCATCCGCGTGAAGCACCTGTGCAAGCTGCT
GCGGCGCCAAAGCCCTGACCGACTGTGTCCTGACCCGCGAGCCGAGCTGGAGCTGGCCGAGAACCCGCGAGATCTTACGTGGACCGCGCCGCCAACCGGAGACCAAG
TGTACTACGACCCCTCCAAGGACCTGTATCGCGAGATCCAGAAGCAGGGCCACGACCAAGTGGACTTACCAAGGAGCCCCCAAGAACCTGAAG
ACCGGCAAGTACGCCCGCCGCAAGTCCGCCACACCAACGAGTGAAGCAGTGCACCGAGGTGGTGCAGAAGATCGCCACCGAGGGCATCGTGATCTGGGG
CAAGGTGCCCCAAGTTCGCGCTGCCATCCAGAAGGAGACCTGGGAGATCTGGTGACCGAGTACTGGCAGGCCACCTGGATCCCCGAGTGGGAGTTCGTGA
ACACCCCCCTGGTGAAGCTGTGTTACAGCTGGAGACCGGCCATCGTGGGCGCCGAGACCTTCTACGTGGACCGCGCCGCCAACCGGAGACCAAG
CTGGGCAAGCGCGGTACGTGACCGACCGCGCGCCAGAAAGTGGTGGCCCTGACCGAGACCAACAGAGCTGCAGGCCACCCCGACAAGTCCGAGTCCGAGTGGTGA
CCTGCAGGACTCCGGCTCCGAGGTGAACATCGTGACCGACTCCAGTACGCCCTGGGCATCATCCAGGCCACCCCGACAAGTCCGAGTCCGAGTGGTGA
ACCAGATCATCGAGCAGCTGATCCAGAAGGAGCGGTGTACCTGTCTGGTGGTGGCCGCCCAAGGGCATCGCGGCAACGAGCAGGTGGACAAGCTGGTG
TCCACCGGCATCCGCAAGTGTGTCTTGACCGGCATCGACAAAGGCCAGGAGGACACGAGAAGTACCACTCCAACTGGCGGCCCATGGCCTCCGACTT
CAACCTGCCCCCGTGGTGGCCAAAGGATCGTGGCCCTCTTGCGAACAGTGGCCAGCTGAAGGGCGAGGCCATGCACGGCCAGGTGGACTGCTCCCCCGGCA
TCTGGCAGCTGGACTGCACCCACCTGGAGGGCAAGATCATCTGGTGGCGGTGACGTGGCCCTCCGGCTACATCGAGGCCGAGGTGATCCCCCGCCGAGACC
GGCCAGGAGACCGCCTACTTCATCTGAAGTGGCGCGCGCTGGCCCTGAAGATCATCCACACCGACACCGGTCCCACTCCACCTGGTGA
GGCCGCTGTGTGGCGCGGCATCCAGCAGGAGTTCGAGATCCCCACACCCCGAGTCCAGGGCGTGGTGGAGTCCATGAACAAGAGCTGAAGAAGA
TCATCGGCCAGGTGCGGACCCAGGCCGAGCACCTGAAGACCGCGCTGCAGATGGCCGTGTTCATCCACAACCTCAAGCGCAAGGGCGGCATCGGCGGTAC
TCCGCGCGGAGCGCATCATCGACATCATCGCCACCGACATCCAGACCAAGGAGCTGCAGAAGCAGATCACCAAGATCCAGAACTTCCGCGTGTACTTCCG
CGACTCCCCGACCCCGTGTGAAGGGCCCCCGCAAGCTGTGTGAAGGGCGAGGGCGCGCTGGTGTATCCAGGACAAACACAGATCAAGGTGGTGGCCCC
GCCGCAAGGCCAAAGATCATCCGCGACTACGGCAAGCAGATGGCGCGCGACGACTGCGTGGCCGCGCCGCGCAGGACGAGGACTAA

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Fig. 116B

2003_CON_G_pol.OPT

TTCTTCCGGAGAACCTGGCCCTTCCAGCAGGGCGAGGCCCGCGAGTTCTCCTCCGAGCAGGGCCCGCGCCCAACTCCCCCAACCCCGCGCGAGCTGCGCGTGCG
CCGCGCGCACTCCCCCTGCCCGAGGCGGCGCGAGGGCAAGGGGCCCATCTCCTGTCTCTCCCCAGATACCCCTGTGGCAGCGCCCTTGGTGACCG
TGAAGATCGGCGCCAGCTGATCGAGGCCCTGTGACACCGGCGCGACGACACCGTGTGGAGGAGATCAACCTGCCCGCAAGTGAAGCCCAAGATG
ATCGCGGCATCGGCGGCTTATCAAGGTGCGCCAGTACGACCAAGATCCTGATCGAGATCTCCGGCAAGAGGCCATCGGCACCGTGTGGTGGCCCCAC
CCCCATCAACATATCGGCGCGCAACATGCTGACCCAGATCGGCTGCACTTCCCATCTCCCCATCGAGACCGTGGCCCTGAAGCTGAAGCCCG
GCATGGACGGCCCCAAGGTGAAGCAGTGGCCCTGACCGAGGAGAAGATCAAGGCCCTGACCGAGATCTGCACCGAGATGGAGAGGAGGCAAGATCTCC
AAGATCGGCCCCCGAGAACCCCTACAACACCCCATCTTCGCCATCAAGAGAAGGACTCCACCAAGTGGCGCAAGCTGGTGACTTCCGCGAGCTGAACAA
GCGACCCAGGACTTCTGGGAGGTGAGTGGGCATCCCCACCCCGCGGCTGAAGAAGAAGTCCGTGACCCGTGTGGAGCTGGCGGACGCCCTACT
TCTCGTGCCCTGGACGAGAACTTCCGCAAGTACACCGCTTACCATCCCTCCACCAACAGAGACCCCGGCTCCGCTACCGTACCAACAGTGTG
CCCCAGGGCTGGAAGGGCTCCCCCGCATCTTCCAGTCCCTCCATGACCAAGATCTCTGGAGCCCTTCCGACCAAGAACCCCGAGATCGTGATCTACCACTA
CATGGACGACCTGTACGTGGCTCCGACCTGGAGATCGGCGCACCGGCCAAGATCGAGGAGCTCGCGAGACCTGTGCTGGCTTCAACCAACC
CCGACAAGAAGCACCAAGAGGAGCCCCCTTCTGTGGATGGGTACGAGCTGACCCCGACAAGTGAAGCCGTGCAGCCCATCCAGTCCCCGACAAGGAG
TCCTGGACCGTGAACGACATCCAGAACCTGGTGGCAAGCTGAACCTGGGCCCTCCAGATCTACCCCGCATCAAGTGAAGCAGCTGTGCAAGCTGTGCG
CGGCGCAAGGCCCTGACCGACATCGTGCCCTGACCGCGAGGCCGAGCTGGAGCTGGCCGAGAACCGCGAGATCTCTGAAGGAGCCCGTGCACGGCGTGT
ACTAGACCCCTCCAGGAGCTGATCGCCGAGGTGCAGAGCAGGGCTGGACCACTGAGCTACAGATCTACAGGAGCCCTACAAGAACCTGAAGACC
GGCAAGTACGCCAAGCGGGCTCCGCCCAACCAACGACCTGAAGCAGCTGACCGAGGTGTGAGAGATCGCCACCGAGTCCATCTGTATCTGGGGCAA
GACCCCAAGTCAAGTGCCCATCCGCAAGGAGACCTGGAGGTGTGGTGAACGAGTACTGGCAGGCCACCTGGATCCCGAGTGGGAGTTCGTGAACA
CCCCCCCCCTGTGAAGCTGTGTACCGCTGGAGACCGAGCCCATCCCCGGCGCGGAGACCTACTACGTGGAAGGCGCCCAACCGCGAGACCAAGCTG
GGCAAGGCCGGCTACGTGACCGACAAGGCAAGCAGAGATCATACCCCTGACCGAGACCAACCAAGAGCCGAGCTGCAGGCCATCCACCTGGCCCT
GCAGGACTCCGGCTCCGAGGTGAACATCGTGACCGACTCCAGTACGCCCTGGGCATCATCCAGGCCAGCCCGACCGCTCCGAGTCCGAGTGGTGAACC
AGATCATCGAGCAGCTGATCAAGAGGAGAGAGGTGTACCTGTCTGGTGCCCGCCCAACAGGGCATCGGCGGCAACGAGCAGTGGACAAGTGGTGTCC
TCCGGCATCCGCAAGGTGTCTTCTGGACGGCATCGACAAGGCCCGAGGAGCAGCAGCGCTACCACTCCAACTGGCGGCCATGGCCTCCGACTTCAA
CCTGCCCCCATCGTGGCCCAAGGAGATCGTGGCTCTTGGCAAGTGCAGCTGAAGGGCAGGCCATGCACGGCCAGGTGGACTGCTCCCCCGGCATCT
GGCAGTGGACTGCACCCACCTGGAGGGCAAGATCATCTGTGTGGCCGTGCACTGGCTTCCGGCTACATCGAGGCCGAGGTGATCCCCCGCGAGACCGGC
CAGGAGACCGCTACTTCTATCTGAAGCTGGCCCGCGCTGGCCCGTGAAGTGTATCCACACCGACAACGGCTCCAACCTTCACTCCGCGCGCTGAAGGC
CGCCTGTGTGGGCCAACATCACCCAGGATTCGGCATCCCTTACACCCCGAGTCCAGGGCGTGGTGGAGTCCATGAACAAGGAGCTGAAGAAGATCA
TCGGCCAGGTGGCCACCGCCGAGCACCTGAAGACCGCGTGCAGATGGCCGTGTCTATCCACAACCTCAAGCGCAAGGGCGGCATCGGCGGCTACTCC
GCCGCGAGCGCATCATCGACATCATCGCCTCCGACATCCAGACCAAGGAGCTGCAGAAGCAGATCAACAAGATCCAGAACTTCCGCGTGTACTACCGCGA
CTCCCGGACCCCATCTGGAAGGGCCCCGCAAGCTGTGTGAAGGGCGAGGGCGCGCTGGTGTATCCAGGACAAACAGGATCAAGGTGGTGGTCCCCCGC
GCAAGGCCAAGATCATCCGCGACTACGGCAAGCAGATGGCCCGCGGACGACTGGCTGGCCCGCGCGCAGGACGAGGACTAA

Fig. 117A

74. 2003 CON H pol.PEP

FFRENLAFOQREARKFSPEQARANSPTSRELVRRGDDPLSEAGAEQGTSLSPQITLWQRPVTVKIEGQIREALLDTGADDTVLEEINL
 PGKWKPMIGGIGGFIKVRQYEQVAIEICGKKAIGTVLGPVPIIIGNILTOIGCTLNFPISPIETVPVKLPGMDGPKVKQWPLTEEKI
 KALTEICIEMEKEGKISKIGPENPYNTPIFAIKKDKSTKWRKLVDFRELNKRTODFEWQLGIPHPAGLKKKSVSLDVGDYFVSFPLDKD
 FRKYTAFTIPSINNETPGIRYQYNVLPQGWKGSIPAIFQSSMTKILEPFRKQNPENIIYQYMDLLYVGSDEIGQHRAKIEELRAHLLRWGFT
 TPDKKHQKEPPFLWMGYELHPDKWTVPVKLPEKDSWTVNDIQKLVGKLNWASQIYPGIVKQCLLKGAKALTDIVPLTKAEAELELAENR
 EILREPVHGVYDPSKDLIAEIQKQPDQWTYQIYQEPFKNLTKGYAKMRTAHTNDVKQLTEAVQKIATESIVWGIKIPKFRLPQKETWE
 TWTTEHWQATWIPWEFVNTPHLVKLWYQLETEPIAGAETYYVDGAANRETKIGKAGYVTDGKQKVVSLETETNQKTELQAIYALQDSGL
 EVNIVTDSQYALGIIQAQPDKSESELVNOIIEELIKKEKVVLSWVPAHKGIGGNEQVDKLVSSGIRKVLFLDGIDKAQEEHRYHNNWRAMA
 SDFNLPIVAKIEIVASCDKQKGEAMHGQVDCSPGIWQLDCTHLEGKVLVAVHVASGYIEAEVIPAETGQETAYFILKLAGRWPVKMIHT
 DNGSNFTSAAVKAACWWADIQQEFGIPYNPQSQGVVESMNKELKKIIGQVRDQAEHLRTAVQMAVFIHNEKRKGIGGYSAGERIIDIATD
 IQTKELQKQISKIQFRVYRDSRDPINWKGPAKLLWKGEAVVIQDNSEIKVVPRRKAKIIRDYKGQMGAGDDCVAGRQDEDS

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Fig. 118A

75. 2003 CON 01 AE pol.PEP

FFRENLAFOQKAGEFSSEQTRANSPTSRLKLDGGRDNLLEAGAEQGTSSSFPPQITLWQRPVTVKIGGQKKEALLDTGADDTVLEDI
 NLPCKWKPMIGGIGGFIKVRQYDQILIEICGKKAIGTVLGPVPIIIGNMLTOIGCTLNFPISPIDTVPTLPGMDGPKVKQWPLTEE
 KIKALTEICKEMEKEGKISKIGPENPYNTPVFAIKKDKSTKWRKLVDFRELNKRTODFEWQLGIPHPAGLKKKSVSLDVGDYFVSFPLD
 ESFRKYTAFTIPSINNETPGIRYQYNVLPQGWKGSIPAIFQSSMTKILEPFRKQNPENIIYQYMDLLYVGSDEIGQHRTKIEELRAHLLSWG
 FTTDPDKKHQKEPPFLWMGYELHPDRWTVPVIELPEKDSWTVNDIQKLVGKLNWASQIYAGIKVKQCLLKGAKALTDIVPLTEAEAELELAE
 NREILKTPVHGVYDPSKDLVAEVQKQDQWTYQIYQEPFKNLTKGYARKRSRASHNDVRQLTEVVQKIATESIVWGTTPKFRLPQIQUET
 WETWMEYQATWIPWEFVNTPLVLWYQLEKDPVIGAEFTFYVDGAASRETKLGKAGYVTDGKQKVVSLETETNQKTELHAIHLALQDS
 GSEVNIIVTDSQYALGIIQAQPDSESEVNVQIIEELIKKEKVVLSWVPAHKGIGGNEQVDKLVSSGIRKVLFLDGIDKAQEEHRYHNSWRT
 MASDFNLPIVAKIEIVANCDKQKGEAMHGQVDCSPGIWQLDCTHLEGKVLVAVHVASGYIEAEVIPAETGQETAYFLLKLAGRWPVKVI
 HTDNGSNFTSAAVKAACWWANVRQEFIPYNPQSQGVVESMNKELKKIIGQVREQAEHLKTAVQMAVFIHNFRRKGIGGYSAGERIIDI
 TDIQTKELOKQITKIQNFRVYRDSRDPINWKGPAKLLWKGEAVVIQDNSEIKVVPRRKAKIIRDYKGQMGAGDDCVAGRQDEDS

Fig. 117B

2003_CON_H_pol.OPT

TTCTTCGGGAGAACCTGGCCCTCCAGCAGCGGAGGCCCGCAAGTTCTCCCCCGAGCAGGCGCGCCCAACTCCCCACCTCCCGGAGCTGCGCGTGG
CCGCGGCGACGACCCCTGTCCGAGGCGCGGCGGAGGGCCAGGGACCTCCCTGTCTTCCCCCAGATCACCTGTGGCAGCGCCCTGGTGACCGTGA
AGATCGAGGGCCAGTGGCGAGGCGCTGTGGACACCGGCGCGACACCGTGTGGAGGAGATCAACCTGCCCGCAAGTGAAGCCCAAGATGATC
GGCGGCATCGCGGCTTCATCAAGTGGCGCAGTACGAGCAGTGGCCATCGAGATCTGCGGCAAGAGCCATCGGACCGTGTGGTGGGCCCCACCCC
CGTGAACATCATCGCGCGCAACATCCTGACCCAGATCGGCTGACCCCTGAACCTGAACCTTCCCCATCTCCCCATCGAGACCGTGCCCGTGAAGTGAAGCCCCGGCA
TGGACGGCCCCAAGGTGAAGCAGTGGCCCCCTGACCGAGGAGAAATCAAGGCCCTGACCGGATCTGCATCGAGATGGAGAGGGCAAGATCTCCAAG
ATCGGCCCCGAGAACCCCTACAAACACCCCCATCTTGGCCATCAAGAAAGAGGACTCCACCAAGTGGCGCAAGCTGGTGGACTTCCGCGAGCTGAACAAGCG
CACCCAGGACTTCTGGGAGGTGCAGCTGGGCATCCCCACCCCGGCTGAAGAAGAAGTCCGTGTCCGTGTGGACGTGGCGGAGCGCCTACTTCT
CCGTGCCCCGTGACAAAGACTTCCGCAAGTACACCGCTTACCATCCCCCTCCATCAACAAGAGACCCCGGCATCCGCTACCAAGTACAAAGTGTGCCCC
CAGGGCTGAAGGGCTCCCCCGCCATCTTCCAGTCTTCCATGACCAAGATCCCTGGAGCCCTTCCGCAAGCAGAACCCCGAGATGATCATCTACAGTACAT
GGACGACCTGTACGTGGCTCCGACCTGGAGATCGGCCAGCACCGGCCAAGATCGAGGAGCTGCGCGGAGTCCCGAGATGATCATCTACAGTACAT
ACAGAAGCACCAAGAGGCCCCCTTCTGTGGATGGGTACGAGTGGACACCCCGCAAGTGGACCGTGCAGCCCGTGAAGTGCCTGCAAGAGGACTCC
TGGACCGTGAACGACATCCAGAAGCTGGTGGGCAAGCTGAACCTGGGCTCCAGATCTACCCCGGCATCAAGGTGAAGCAGCTGTGCAAGCTGTGCGCGG
CGCCAAGCCCTGACCGACATCGTGCCCTGACCAAGGAGGCGGAGCTGGAGCTGGCCGAGAACCGCGAGATCTTGGCGAGCCCGTGCACGGCGTGTACT
ACGACCCCTCCAAGGACCTGATCGCGGAGATCCAGAAGCAGGCCCCGACAGTGGAGCTGGCCGAGTGGAGTGAAGCAGCTGTGCAAGCTGTGCGCGG
AAGTACGCCAAGATGCGCACCCGACCAACGACGTGAAGCAGTGACCGAGGCGGTGCAGAAGATCGCCACCGAGTCCATCGTGATCTGGGGCAAGAT
CCCCAAGTTCGCGCTGCCATCCAGAAGGAGACCTGGGAGACCTGGTGGACCGAGCTGGAGGCCACCTGGATCCCCGAGTGGGAGTTCGTGAACACCCC
CCACCTGGTGAAGCTGTGGTACCAAGCTGGAGACCGAGCCCATCGCCGGCGGAGACCTACTACGTGGACGGCGCGCCCAACCGCGAGACCAAGATCGGC
AAGGCCGGCTACGTGACCGACCGGGCAAGCAGAAGTGGTGTCCCTGACCGAGACCAACCAAGAGACCGAGCTGCAGGCCATCTACCTGGCCCTGCA
GGACTCCGGCTGGAGGTGAACATCGTGACCGACTCCAGTACGCCCTGGGCATCATCCAGGCCCGAGCCCGCAAGTCCGAGTCCGAGTGGTGAACCA
TCATCGAGGAGCTGATCAAGAAGAGAGGTGTACCTGTCTGGGTGCCCGCCCAAGGGCATCGCGGCAACGAGCAGGTGGACAAAGCTGGTGTCTCC
GGCATCCGCAAGGTGTCTTGGACGGCATCGACAAGGCCCGAGGAGGACGAGCGCTACCAACAACACTGGCGGCCATGGCCTCCGACTTCAACCT
GCCCCCATCGTGGCCAAAGGAGATCGTGGCCCTCTGCGACAAGTCCAGCTGAAGGGCGAGGCCATGCACGGCCAGGTGGACTGCTCCCCCGGCATCTGGC
AGCTGGACTGCACCCACCTGGAGGGCAAGGTGATCCTGTGGCGGTGCAGTGGCTCCGGGTACATCGAGGCCGAGGTGATCCCCCGCGAGACCGGCCAG
GAGACCGCTACTTCACTCTGAAGCTGGCCGGCGCTGGCCCGTGAAGATGATCCACACGACACGGCTCCAACTTCACTCCGCGCGCTGAAGGCCCG
CTGCTGGTGGCCGACATCCAGCAGGAGTTCGGCATCCCTTACACCCCGAGTCCAGGGCGTGTGGAGTCCATGAACAAGAGCTGAAGAAGTCAATCG
GCCAGTGGCGGACAGCCCTGGCACCCTGGTGCAGTGGCCGTGTTATCCACAATTCAGAGCGCAAGGGCGCATCGCGGGCTACTCCGCC
GGGAGGGCATCATCGACATCATCGCCACCGACATCCAGACCAAGGAGTGCAGAAGCAGATCTCCAAGATCCAGAAGTTCGCGGTGTACTACCGCGACTC
CCGCGACCCCATCTGGAAGGGCCCCGCAAGCTGTGTGAAGGGCGAGGGCGCGTGTGTATCCAGGACAACTCCGAGATCAAGGTGGTGGCCCCCGCGCA
AGGCCAAGATCATCCGGGACTACGGCAAGCAGATGGCCCGCGGACGACTGCGTGGCGCGCGCGGACGAGGACTAA

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Fig. 119A

76. 2003 CON 02 AG pol. PEP
 FFRENLA~~FQ~~QGE~~AR~~K~~F~~SE~~Q~~TG~~T~~NS~~P~~TRELWDGGRDNL~~L~~SEAGTEGQ~~T~~ISSFNFPQITLWQRP~~L~~TV~~V~~RIGGQ~~L~~EAL~~L~~DTGAD~~T~~VLEEI
 NLP~~G~~K~~W~~K~~P~~K~~M~~IGGIGG~~F~~IK~~V~~RQYDQILIEICGKKAIGTVL~~V~~GPTPVNIIGRNMLTQIGCTLN~~F~~PISPIETVPV~~K~~LKPGMDGPKVKQWPLTEE
 KIKALTDICTEMEKEGKISKIGPENPYNTPVFAIKK~~K~~DS~~T~~K~~W~~RKLVD~~F~~RELN~~K~~RTQDFEW~~Q~~LGI~~P~~HPAGLKK~~K~~SV~~T~~VL~~D~~VGDAYFSVPLD
 KDFRKYTAFTIPSVNNETPGIRYQYNVLPQGWKGS~~P~~AI~~F~~QASMTKILEP~~F~~RTKNPEI~~V~~IYQYMD~~L~~LVGSDLEIGQHRAKIEELREHLLRWG
 FTT~~P~~DKKHQKEPPFLW~~M~~G~~E~~YELHPDKWTVP~~Q~~PIQLPEK~~D~~SW~~T~~VNDIQKLVGKLN~~W~~ASQIYAGIKVQ~~L~~CKL~~R~~GAKALTDIV~~T~~LTEEAELAE
 NREILKEPVHGVYDPTKDLIAEIQKQGDQW~~T~~YQIYQEPFKNLKTGKYAKM~~R~~SAHTNDVK~~L~~TEV~~V~~QK~~V~~ATESI~~V~~W~~G~~KTPK~~F~~RLPIQRET
 WEAWMEYQATWIP~~E~~W~~E~~FVNT~~P~~PLV~~K~~LWYQLEKDP~~I~~VGAETFYVDGAANRET~~K~~L~~G~~KAGYV~~T~~DRGRQ~~K~~V~~S~~L~~T~~ETTNQKTELHAIHLALQDS
 GSEVNI~~V~~TD~~S~~QYALGIIQAQPD~~R~~SESELV~~N~~QII~~E~~K~~L~~IEK~~D~~KV~~L~~SW~~P~~PAHKGIGGNEQ~~V~~DKLV~~S~~NGIRK~~V~~L~~F~~LDGIDKAEHEHRYHSNWRA
 MASDFNLPPIVAKEIVASCDK~~Q~~LKGEAMHGQVDCSPGIWQ~~L~~DCTHLE~~G~~KIILVAVHVASGYIEAEVIPAETGQETA~~F~~ILKLAGRWPVKVI
 HTDNGSNFTSAAVKAACW~~A~~NV~~T~~QEF~~G~~IPYNPQSQGV~~E~~SMN~~K~~ELK~~K~~II~~G~~QVRDQAEHLK~~T~~AVQMAVFIH~~N~~FRKKGIGGYSAGERIIDIIA
 SDIQTKELOQITKIQNFRVY~~R~~DSRDP~~I~~WKGPAKLLWKGEGAVVIQD~~N~~SDIKVVP~~R~~RRKAKIIRDYGKQ~~M~~AGDDCVAGRQDED\$

Fig. 120A

77. 2003 CON 03 AB pol. PEP
 FFRENLA~~FQ~~QRE~~AR~~K~~F~~SE~~Q~~TRAIS~~P~~TSRKLWDGGRDNL~~P~~PETGTERQGTASSFNFPQITLWQRP~~L~~TV~~V~~RIGGQ~~L~~EAL~~L~~DTGAD~~T~~VLEDI
 NLP~~G~~K~~W~~K~~P~~K~~M~~IGGIGG~~F~~IK~~V~~RQYDQILIEICGKKAIGTVL~~V~~GPTPVNIIGRNMLTQIGCTLN~~F~~PISPIETVPV~~K~~LKPGMDGPKVKQWPLTEE
 KIKALTDICKEMEKEGKISKIGPENPYNTPVFAIKK~~K~~DS~~T~~K~~W~~RKLVD~~F~~RELN~~K~~RTQDFEW~~Q~~LGI~~P~~HPAGLKK~~K~~SV~~T~~VL~~D~~VGDAYFSVPLD
 QDFRKYTAFTIPSTNNETPGIRYQYNVLPQGWKGS~~P~~AI~~F~~QSSMTKILEP~~F~~RKQNP~~E~~I~~V~~IYQYMD~~L~~LVGSDLEIGQHRTKIEELREHLLRWG
 FTT~~P~~DKKHQKEPPFLW~~M~~G~~E~~YELHPDKWTVP~~Q~~PIVLPEK~~D~~SW~~T~~VNDIQKLVGKLN~~W~~ASQIYAGIKV~~R~~Q~~L~~CKL~~R~~GAKALTEVI~~P~~LTAEAELAE
 NREILKEPVHGVYDPSKDLVAEIQKQGDQW~~T~~YQIYQEPFKNLKTGKYARL~~R~~G~~A~~HTNDVK~~L~~TEA~~V~~QK~~I~~ATESI~~V~~W~~G~~KTPK~~F~~KLPIQKET
 WETWTEYWQATWIP~~E~~W~~E~~FVNT~~P~~PLV~~K~~LWYQLEKEPIVGAETFYVDGAANRET~~K~~SGKAGY~~V~~TDRGRQ~~K~~V~~S~~L~~T~~DTTNQKTELQAIHLALQDS
 GLEVNIV~~T~~DSQYALGIIQAQPD~~K~~SESELV~~S~~QII~~E~~QLIKKEKVYLAW~~P~~PAHKGIGGNEQ~~V~~DKLV~~S~~AGIRK~~V~~L~~F~~LDGIDKAEHEHRYHSNWRA
 MASDFNLPPVVAKEIVASCDK~~Q~~LKGEAMHGQVDCSPGIWQ~~L~~DCTHLE~~G~~KIILVAVHVASGYIEAEVIPAETGQETA~~F~~ILKLAGRWPVKII
 HTDNGSNFISTAVKAACW~~A~~GIKQEF~~G~~IPYNPQSQGV~~E~~SMN~~K~~Q~~L~~KQII~~G~~QVRDQAEHLK~~T~~AVQMAVFIH~~N~~FRKKGIGGYSAGERIIDIIA
 TDIQTKELOQIIKIQNFRVY~~R~~DSRDP~~I~~WKGPAKLLWKGEGAVVIQD~~N~~NDIKVVP~~R~~RRKAKIIRDYGKQ~~M~~AGDDCVASRQDED\$

Fig. 119B

2003_CON_02_AG_pol.OPT

TTCTTCGGGAGAACCTGGCCCTCCAGCAGGGCGAGGCGCCGCAAGTTCTCTCCGAGCAGACCGGCACCAACTCCGCCACCTCCCGCGAGCTGTGGGACGG
CGGCGGACAACTGTGTCCGAGGCGGACCGAGGGCCAGGGACCATCTCCTCTTAACCTTCCCCAGATCACCTGTGGCAGCGCCCCCTTGGTGA
CCGTGCGCATCGGCGGCGAGCTGATCGAGGCGCTGTGGACACCGGCGCCGACGACACCGTGTGAGGAGATCAACTGCCCCGGAAGTGGAAAGCCCCAAG
ATGATCGGCGGCATCGGCGGCTTCATCAAGGTGCGCCAGTACGACACAGATCTCTGATCGAGATCTGCGGCAAGAAGGCCATCGGCACCGTGTGTGGTGGGCC
CACCCCGTGAACATCATCGGCGCAACATGTCACCCAGATCGGCTGACCCCTGAACCTTCCCCATCTCCCCATCGAGACCGTCCCGTGAAGCTGAAGC
CCGCATGGACGGCCCCAAGTGAAGCAGTGGCCCCCTGACCGAGGAGAAGATCAAGGCCCTGACCGCATCTGCACCGAGATGGAGAAGGAGGCAAGATC
TCCAAGATCGGCCCCGAGAACCCCTACAACACCCCGTGTTCGCCATCAAGAAGAGGACTCCACCAAGTGGCGCAAGCTGGTGGACTCCGCGAGCTGAA
CAAGCGACCCAGGACTTCTGGAGGTGCAGCTGGGCATCCCCACCCCGCGGCCCTGAAGAAGAAGAAAGTCCGTGACCGTGTGGACGTGGGCGGACGCT
ACTTCTCCGTGCCCTGGACAAGGACTTCGCAAGTACACCGCTTCAACATCCCCCTCGTGAACACGAGACCCCGGCATCCGCTACCGATACACAGCTG
CTGCCCCAGGGCTGAAGGGCTCCCCGCCATCTTCCAGGCCCTCCATGACCAAGATCTTGGAGCCCTTCCGCACCAAGAACCCCGAGATCGTGATCTACCA
GTACATGGACGACCTGTACGTGGGCTCCGACCTGGAGATCGGCACGACCCGCGCAAGATCGAGGAGCTGGCGGAGCACTGCTGGCTGGGGCTTCACCA
CCCCGACAAGAAGCACCAAGAGGAGCCCCCTTCTGTGGATGGCTACGAGCTGCACCCCGACAAGTGGACCGTGCAGCCCATCCAGCTGCCCGAGAG
GACTCTGGACCGTGAACGACATCCAGAAGCTGGTGGCAAGCTGAACCTGGGCCCTCCAGATCTACGCCGGCATCAAGTGAAGCAGCTGTGCAAGCTGCT
GCGGCGGCCAAGGCCCTGACCGACATCGTGACCCCTGACCGAGGAGGCCGAGCTGGAGCTGGCCGAGAACCGCGAGATCTCTGAAGAGCCCCGTGCACGGC
TGTACTACGACCCCAAGGACCTGATCGCGGAGATCCAGAAGCAGGGCCAGGACCACTGAGCTACCAAGATCTACCAAGGAGCCCTTCAAGAACCTGAAG
ACGGCAAGTACGCCAAGATCGCTCCGCCACACCAAGACGTGAAGCAGCTGACCGAGGTGTCAGAAGTGGCCACCGAGTCCATCGTGATCTGGG
CAAGACCCCAAGTTCGGCTGCCATCCAGCGCGAGACCTGGAGGCTGTGGATGGAGTACTGGCAGGCCACCTGGATCCCCGAGTGGGAGTTCGTGA
ACACCCCCCTGGTGAAGCTGTGGTACAGCTGGAGAAGGACCCCATCGTGGGCGCGGAGACCTTCTACGTGGACGGCGCGCCCAACCGCGAGACCAAG
CTGGCAAGGCGGCTACGTGACCGACCGCGCGCGCAGAAAGTGGTGTCCCTGACCGAGACCAACCAAGAGCTGCACGCCAGCCGCTCCGAGTCCGAGCTGGTGA
CCTGACGAGCTCCGGCTCCGAGGTGAACATCGTGACCGACTCCAGTACGCCCTGGGCATCATCCAGGCCAGCCGACCGCTCCGAGTCCGAGCTGGTGA
ACAGATCATCGAAGACTGATCGAGAAGGACAAGTGTACCTGTCTGGTGCCCGCCACAGGGCATCGGCGGCAACGAGCAGGTGGACAAGCTGGTG
TCCACGGCATCCGCAAGTGTCTTCCGACGGCATCGACAAGGCCAGGAGGACGACGAGCGCTACCACTCCAACCTGGCGCGCCATGGCCTCCGACTT
CAACCTGCCCCCATCGTGGCCAAAGGAGATCGTGGCTCCTGCGACAAGTGCAGCTGAAGGGCGAGGCCATGCACTGGCCAGGTGGACTGCTCCCCCGCA
TCTGGCAGTGGACTGCACCCACTGGAGGGCAAGATCATCTGTGTGGCTGACGTGGCTCCGGTACATCGAGGCCGAGGTGATCCCCGCGGAGACC
GGCAGGACCGGCTACTTCTGAAAGTGGCGCGCTGGCCGTGAAGTGTATCCAGACCGACAACGGCTCCAACCTTCACTCCGCGCGCGTGAA
GGCCGCTGTGTGGTGGGCCAACGTGACCCAGGAGTTCGGCATCCCTACAACCCCGAGTCCAGGGCGTGGTGGAGTCCATGAACAAGAGCTGAAGAAGA
TCATCGGCGAGGTGCGGACCGAGCACCTGAAGACCGCGTGCAGATGGCCGTGTTCATCCACAACCTTCAAGCGCAAGGGCGGCATCGGCGGCTAC
TCCGCGGCGGAGCGCATCATCGACATCATCGCCTCCGACATCCAGACCAAGGAGCTGCAGAAGCAGATCAACCAAGATCCAGAACTTCCGCGGTACTACCG
CGACTCCCGGACCCCATCTGGAAGGGCCCCGCCAAGCTGTGTGGAAGGGCGAGGCGCGCTGGTGTATCCAGGACAACTCCGACATCAAGGTGGTGGCCCC
GCCGCAAGGCCAAGATCATCCGCGACTACGGCAAGCAGATGGCCGCGGACGACTGCGTGGCCGCGCCAGGACGAGGACTAA

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Fig. 120B

2003_CON_03_AB_pol.OPT

TTCTTCGCGGAGAACCTGGCCTTCAGCAGCGCGAGGCCCGCAAGTTCTCTCCGAGCAGACCCCGGCCCATCTCCCGCACCTCCCGCAAGCTGTGGACGG
CGGCCGCGACAACCCCTGCTCCCGAGACCGGCACCGAGCGCCAGGGCACCGCTCTCTTCAACTTCCCCCAGATCACCTGTGGCAGCGCCCCCTGGTGA
CCGTGCGCATCGGGGCGCAGCTGAAGGAGGCCCTGCTGGACACCGCGCGGACACCGTCTGGAGGACATCAACCTGCCCGGCAAGTGAAGCCCAAG
ATGATCGGCGGCATCGGCGCTTCATCAAGTGGCGCCAGTACGACACAGATCCTGTATCGAGATCTGGGCAAGAGGCCCATCGGCACCGTGTGGTGGGCC
CACCCCGTGAACATCATCGGCGCAACATGCTGACCCAGCTGGCTGCAACCTGAACCTTCCCATCTCCCCCATCGAGACCGTGGCCGTGACCCCTGAAGC
CCGGCATGGACGGCCCCAAGTGAAGCAGTGGCCCCCTGACCGAGGAGAAATCAAGGCCCTGACCGCATCTGCAAGGAGATGGAGAGGAGGCAAGATC
TCCAAGATCGGCCCCGAGAACCCCTACAACACCCCGCTGTTCCCATCAAGAAAGGACTCCACCAAGTGGCGCAAGCTGGTGGACTTCCGCGAGCTGAA
CAAGCGCACCCAGGACTCTGGGAGGTGAGCTGGGCATCCCCACCCCGCGCTGAAGAAGAAGTCCGTGACCGTGTGGACGTGGCGGACGCGCT
ACTTCTCCGTGCCCCCTGGACCAAGACTTCCGCAAGTCTCCAGTCTCCATGACCAAGATCCTGGAGCCCTTCCGCAAGCAACCGAGACCCCGAGATCGTATACCA
CTGCCCCAGGGCTGGAAGGGCTCCCCCGCATCTCCAGTCTCCATGACCAAGATCCTGGAGCCCTTCCGCAAGCAACCGAGACCCCGAGATCGTATACCA
GTACATGGACGACCTGTACGTGGCTCCGACCTGGAGATCGGCCAGCACCGCACCAAGATCGAGGAGTGGCGAGCACTGTGGCTGGGCTTCACCA
CCCCGACAAGAAGCACCAAGAGGCCCTTCTGTGGATGGCTACGAGTGCACCCCGACAAGTGGACCGTGCAGCCCATCGTGTGCTGCCCCGAGAAG
GACTCTGGACCGTGAACGACATCCAGAAGCTGGTGGCAAGTGAACCTGGGCTCCAGATCTACGCCGGCATCAAGTGGCGCAGCTGTGCAAGCTGCT
GCGGGGCCCAAGGCTGACCGAGGTGATCCCCCTGACCGCGAGCTGGAGCTGGCCGAGAACCGGAGATCCCTGAAGGAGGCCCGTGCACGGCG
TGTAACGACCCCTCAAGGACCTGGTGGCCGAGATCCAGAAGCAGGGCCAGGCCAGTGGACCTTACAGGAGCCCTTCAAGAACCTGAAG
ACGGCAAGTACGCCCTGCGCGGCCCAACCAACGACGTGAAGCAGTACCGAGGCCGTGCAAGATCGCACCGGACCTGGATCCCCGAGTGGAGTTCGTGA
CAAGACCCCAAGTTCAGCTGCCATCCAGAAGGAGACCTGGGAGACCTGGGAGACCTGGTGGACCGAGTACTGGCAGGCCACCTGGATCCCCGAGTGGAGTTCGTGA
ACACCCCCCTGGTGAAGCTGTGTACAGCTGGAGAAGGAGCCCATCGTGGCGCCGAGACCTTCTAGTGGACGGCGCCGCCAACCGGAGACCAAG
TCCGGCAAGCGCGCTACGTGACCGACCGCGGCCGAGAGTGTGCTCCCTGACCGACACCAACCAAGATCCAGAGCTGCAGGCCATCCACCTGGC
CCTGCAGGACTCCGGCTGGAGGTGAACATCGTGACCGACTCCAGTACCGCTGGGCATCATCCAGGCCAGCCCGACAAAGTCCGAGTCCGAGCTGGTGT
CCCAGATCATCGAGCAGCTGATCAAGAAGGAGAGGTGTACTTGGCTGGGTGCCCCGCCACAAGGCCATCGGCGGCAACGAGGAGTGGACAAGCTGGTG
TCCCGCGCATCCGCAAGGTGCTGTTCTGGACGGCATCGACAAGGCCAGGAGGCCCAAGAGATCCACTCCAAGTGGCGGCCCATGGCTCCGACTT
CAACCTGCCCCCTGGTGGCCAAAGGATCGTGGCTTCTGCGACAAGTGGCAGCTGAAGGGCGAGGCCATGCAAGCCAGGTGGACTGCTCCCCGGCA
TCTGGCAGCTGGAATGCAACCTGGAGGGCAAGATCATCTGTTGGCTGCGCTGACCTGGCTTACATCGAGGCCGAGGTGATCCCCGCCGAGAGC
GGCAGGAGACCGCTACTTCTGTGAAGTGGCGCGCTGGCCGCTGAGATCATCCACACCGACAACGGCTCCAATCTCTCCACCGCGCTGAA
GGCGCTGTGTGGCGCGCATCAAGCAGGAGTTCGGCATCCCTACAACCCCAAGTCCAGGGCGTGGTGGAGTCCATGAACAAGCAGCTGAAGCAGA
TCATCGGCCAGGTGGCGGACCAAGCGCGAGCACCTGAAGACCGCGTGCAGATGGCGTGTTCATCCACAACCTTCAAGCGCAAGGGCGGCATCGGGCGGTAC
TCCCGCGGAGCGCATCATCGACATCATCGCCACCGACATCCAGACCAAGGAGCTGCAGAAGCAGATCATCAAGATCCAGAACTTCCGCGGTGTACTACCG
CGACTCCCGGACCCCATCTGAAGGGCCCCCAAGCTGCTGTGAAGGGCGAGGGCGCGGTGGTGTATCCAGGACAACAACGACATCAAGGTGGTGGCCCC
GCCGCAAGGCCAAGATCATCCGCGACTACGGCAAGCAGATGGCCGCGGACGACTGCTGGCTCCCCGACGAGGAGGACTAA

Fig. 121A

78. 2003 CON 04 CPX pol. PEP

FFRENVAFQOGEAREFSESEQARANSPTRELRVRRGDSPLPEAGAEQGCAISLSEFPQITLWQRPVLTIKIGQIREALLDTGADDTVLEEIN
 LPGKWKPKMIGGIGGFIKVRQYDQIPIEICGKKAIGTVLVGPTPVNIIGRNMLTOLGTLNFPISPIETVPVKLPGMDGPKVKQWPLTEEK
 IKALTEICTEMEKEGKISKIGPENPYNTPIFAIAKKKNSTRWRKLVDFRELNKRTQDFWEVQLGIPHPAGLKKKKSVTVDVGDAYFSVPLDP
 EFRKYTAFTIPSTNNETPGIRYQYNVLPQGWKGSIPAIFQCSMTKILEPFRKNPEIYIYQYMDLTVGSDEIGQHRAKIEELREHLLRWGF
 STPDKKHKEPPFLWMGYELHPDKWTVPQIQLAEKDSWTVNDIQKLVGKLNWASQIYPGKVKQLCKLLRGAKALTDIVPLTTEAELELAEN
 REILKEPVHGAYYDPSKDLIAEIQKQGQWQTYQIYQEPYKNLKTGKYAKTRSAHTNDVRQLTEAVQKIAMECIVIWGKTPKFRLP IQKETW
 DTWWTEYWOATWIPWEFEVNTPPPLVKLWYQLETDPPIAGAEFFYVDGAASRETKQGKAGYVTDGRQKVVSLSSETTNQKTELQAIYLAQDGS
 SEVNI VTD SQYAIGIIQAQPDRESDELVNQIIIEQLIQKDKVYLSWVPAHKGIGGNEQVDKLVNSGIRKVLFLDGDIDKAQEEHEKYHNNWRAM
 ASDFNLPVVAKEIVASCNKQKLGAEAMHGQVDCSPGIWQDCTHLEGGKIIILVAVHVASGYIEAEVIPAETGQETAYFILKLAGRWPVKIIH
 TDNGSNFTSAAVKAACWWADIQQEFGIPYNPQSQGVVESMNKELKKIIGQVRDQAEHLKTA VQMAVFIHNFKRKGGIGGYSAGERIIDIIAS
 DIQTKELQKQITKIQNFRVYRDSRDP IWKGPALLWKGEAVVIQDN SDIKVVP RRKAKIIRDY GKQ MAGDDC VAGRQDED\$

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Fig. 122A

79. 2003 CON 06 CPX pol. PEP

FFRENLAFOQGEAREFSESEQARANSPTRELRVRRGDSPLPEAGAEQGCAISLSEFPQITLWQRPVLTIRIGGQLIEALLDTGADDTVLEDIN
 LPGKWKPKMIGGIGGFIKVRQYDQIPIEICGKKAIGTVLVGPTPVNIIGRNMLTQIGTLNFPISPIETVPVKLPGMDGPKVKQWPLTEEK
 IKALTEICTEMEKEGKISKIGPENPYNTPIFAIAKKKDKSTWRKLVDFRELNKRTQDFWEVQLGIPHPAGLKKKKSVTVDVGDAYFSVPLDE
 DFRKYTAFTIPSTNNETPGIRYQYNVLPQGWKGSIPAIFQCSMTKILEPFRKNPEIYIYQYMDLTVGSDEIGQHRAKIEELREHLLRWGF
 TTPDKKHKEPPFLWMGYELHPDKWTVPQIQLPKDSWTVNDIQKLVGKLNWASQIYPGKVKQLCKLLRGAKALTDIVPLTAEAELELAEN
 REILKEPVHGAYYDPSKDLIAEIQKQGQWQTYQIYQEPHKNLKTGKYARIKSAHTNDVKQLTEAVQKIALESIVIWGKTPKFRLP IQKETW
 ETWWTEYWOATWIPWEFEVNTPPPLVKLWYQLETPIVGAETFFYVDGAANRETKKGKAGYVTDGRQKVVSLSSETTNQKTELQAINLALQDGS
 SEVNI VTD SQYALGIIQAQPDKSESELVNQIIIEQLIKKEKVYLSWVPAHKGIGGNEQVDKLVSTGIRKVLFLDGDIDKAQEDHERYHSNWRAM
 ASDFNLPPIVAKEIVASCNKQKLGAEAMHGQVDCSPGIWQDCTHLEGGKIIILVAVHVASGYIEAEVIPAETGQETAYFILKLAGRWPVKVIH
 TDNGSNFTSAAVKAACWWANITQEFGIPYNPQSQGVVESMNKELKKIIGQVRDQAEHLKTA VQMAVFIHNFKRKGGIGGYSAGERIIDIIAS
 DIQTKELQKQITKIQNFRVYRDSRDP IWKGPALLWKGEAVVIQDN SEIKVVP RRKAKIIRDY GKQ MAGDDC VAGRQDED\$

Fig. 121B

[illegible]

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Fig. 123A

80.. 2003 CON 08 BC pol.PEP
 FFREILAFQGEAREFPPEQTRANSPTSRELQVRGDNPSSEAGTERQGTLPQITLWQRPVLSIKVGGQIKEALLDTGADDTVLEEVNLP
 KWPKMIGGIGGFIKVRQYEQPIEICGKKAIGTVLGPPTPVNIIGRNMLTQGLTNFPISPIETVPVKKPKMGDPKVKQWPLTEEEKIKA
 LTAICDEMEKEGKITKIGPDNPYNTPIFAIRKKDSSKWRKLVDFRELNRKTQDEWEVOLGIPHAPAGLKKKSVTVLVDGDAYFSVPLDKDFR
 KYTAFTIPSVNNETPGIRYQYNVLPQGWKGSPIAIFQCSMTKILEPFRKQNPDIIVYQYMDLTVGSDLEIGQHRTKIEELREHLLKWGFTTP
 DKKHQKEPFLWMGYELHPDKWTVPQIQLPEKDSWTVNDIQKLVGKLNWASQIYPGIKVRQCLLRGAKALTDIVPLTEEAEELELAENREI
 LKEPVHGAAYDPSKELIAEIQKQGDQWTYQIYOEPFKNLKTGKYAKMRTAHTNDVKQLTEAVQKIAMESIIVGWKIPKFRPLPIQKETWETW
 WTDYWOATWIPWEFEVNTPLVLWYQLEKDPDPIAGVETFYVDGAANRETIGKAGYVTDGRKKIVSLTDTTNQKTELQAIYIALQDSGSEV
 NIVTDSQYALGIIQAQPKSESELVNQIIIEQLIKKERVYLSWVPAHKGIGGNEQVDKLVSNKIRKVLFLDGDIDKAQEEHEKYSNWRAMASD
 FNLPIIVAKEIVASCDQCQLKGEAMHGQVDCSPGIWQLDCTHLEGGKIIILVAVHVASGYIEAEVIPAETGQETAYFILKLAGRWPVKVIHTDN
 GSNFTSAAVKAACWWAGIQOEFGIPYNPQSGVVESMNKKELKLIQVQRDQAEHLKTAVQMAVFIHNFRRKGGIGGYSAGERIVDIIATDIQ
 TRELQKQIIKIQNFRVYYRDSRDPWKGPAKLLWKGEAVVIQDNSDIKVPVRRKAKIIKDYGKQMGADCVAGRQDED\$

Fig. 124A

81.. 2003 CON 10 CD pol.PEP
 FFRENLAFOQRKARELPSEQTRANSPTSRELVRWGGDNTLSETGAERQGAVSLSFPQITLWQRPVTVKIGGQKKEALLDTGADDTVLEEMN
 LPGAQPKMIGGIGGFIKVRQYDQILIEICGYKAIGTVLGPPTPVNIIGRNLLTQIGCTLNFPISPIETVPVKKPKMGDPKVKQWPLTEEK
 IKALTEICTEMEKEGKISRIGPENPNTPIFAIRKKDSTKWRKLVDFRELNRKTQDFWEVOLGIPHAPAGLKKKSVTVLVDGDAYFSVPLYE
 DFRKYTAFTIPINNTPGIRYQYNVLPQGWKGSPIAIFQSSMTKILEPFRKQNPENVIYQYMDLTVGSDLEIGQHRTKIEELRGHLLKWGF
 TTPDKKHQKEPFLWMGYELHPDKWTVPQIQLPEKDSWTVNDIQKLVGKLNWASQIYPGIKVRQCLLRGAKALTDIVPLTEEAEELELAEN
 REILKEPVHGVYDPSKDLIAEIQKQGDQWTYQIYOEPHKNLKTGKYAKRRTAHTNDVKQLTEAVQKIAQESIVIWGKTPKFRPLPIQKETW
 ETWTDYWOATWIPWEFEVNTPLVLWYQLEKEPIVGAETFYVDGAANRETIGKAGYVTDGRQKVISITDTTNQKTELQAINLALQDSG
 SEVNIIVTDSQYALGIIQAQPKSESELVNQIIIEQLIKKERVYLSWVPAHKGIGGNEQVDKLVSSGIRKVLFLDGDIDKAQEEHEKYHNNWRAM
 ASDFNLPVVAKEIVASCDKQKALHGQVDCSPGIWQLDCTHLEGGKIIILVAVHVASGYIEAEVIPAETGQETAYFLLKLAGRWPVKVH
 TDNGSNFTSAAVKAACWWAGIKQEFGIPYNPQSGVVESMNKKELKIIQVQRDQAEHLKTAVQMAVFIHNFRRKGGIGGYSAGERIIDIAT
 DIQTKELQKQIIKIQNFRVYYRDSRDPWKGPAKLLWKGEAVVIQDNSDIKVPVRRKAKIIKDYGKQMGADCVASRQDEDQ

2003_CON_08_BC_pol.OPT

TCTTCCGCGAGATCCTGGCCTTCCCCAGGGCGAGGCCGCGGAGTTCCCCCCCCGAGACCCCGCGCAACTCCCACAACCTCCCGGAGCTGCAGGTGCG
CGGCGACAACCCCTCCTCCGAGCGCGCACCGAGCGCCAGGCCACCCTGAACCTTCCCCAGATCACCTGTGGCAGCGCCCCCTGGTGTCATCAAGGTGG
GCGGCGCAGATCAAGGAGGCCCTGCTGGACACCGCGCGCGACACCGTGTGGAGAGGTGAACCTGCCCGCAAAGTGAAGCCCAAGATGATCGGCGGG
ATCGGCGGCTTCATCAAGGTGCGCATGAGAGAGATCCCCATCGAGATCTGCGGCAAGAAGGCCATCGGCACCGTGTGGTGGGCCCCAACCCCGCTGAA
CATATCGGCGCAACATGTCACCCAGCTGGGTGCACCCCTGAACCTTCCCCATCTGCCCCATCGAGACCGTGCCTGTGAAGCTGAAGCCCGCATGGACG
GCCCCAAGGTGAAGCAGTGGCCCCCTGACCGAGGAGAAGATCAAGGCCCTGACCGCCATCTGCGACGAGATGGAAAGGAGGCAAGATCACCAAGATCGGC
CCCGACAACCCCTACAACACCCCATCTTCGCCATCCGCAAGAAGGACTCTCCAAGTGGCGCAAGCTGGTGGACTTCCCGGAGCTGAACAAGCGCACCCA
GGACTTCTGGGAGGTGCAGCTGGGATCCCCACACCCCGCGGCTGAAGAAGAAGTCCGTGACCGTGTGGACGTGGGCGACGCGCTACTTCTCCGTGC
CCCTGGACAAGGACTTCGCAAGTACACCGCTTTCACCATCCCCCTCCGTGAACAACGAGACCCCCGGCATCCGCTACCACTACAACTGTGCCCCAGGGC
TGAAGGGTCCCCGCCATCTTCCAGTGTCTCATGACCAAGATCCTGGAGCCTTCCGAAGACAACCCCGACATCGTGATCTACCAGTACATGGACGA
CCTGTACGTGGGCTCCGACCTGGAGATCGGCCAGCACCGCACCAAGATCGAGGAGCTGCGGAGACCTGTGAAGTGGGGCTTACCAACCCCGACAAGA
AGCACAGAAGAGCCCCCTTCTGTGGATGGGTACGAGCTGACCCCCGACAAGTGGACCGTGCAGCCCCATCCAGCTGCCCGAGAAGGACTCCTTGGAAC
GTGAACGACATCCAGAAGCTGGTGGCAAGCTGAACCTGGGCTCCCAGATCTACCCCGCATCAAGGTGCGCCAGCTGTGCAAGCTGTGCGGGCGGCCAA
GGCCCTGACCGACATCGTGCCCTGACCGAGGAGGCCGAGCTGGAGCTGGCCGAGAACCGCGAGATCCTGAAGGAGCCCCGTGCACGGCGCTACTACGACC
CCTCAAGGAGCTGATCGCCGAGATCCAGAAGCAGGCGCAGGACCAGTGGACCTACCAGATCTACAGGAGCCCTTCAAGAACTGAAGACCGGCAAGTAC
GCCAAGATGCGACCGCCACACCAACGACGTGAAGCAGCTGACCGAGGCCGTGCAGAAGATCGCCATGGAGTCCATCGTGATCTGGGGCAAGATCCCCAA
GTTCCGCTGCCCATCCAGAAGGAGACCTGGGAGACCTGGTGGACCGACTAGTGGCAGGCCACCTGGATCCCCGAGTGGGAGTTCGTGAACACCCCCCCCC
TGGTGAAGCTGTGGTACCAGCTGGAGAAGGACCCCATCGCGGCGTGGAGACCTTCTACGTGGACGGCGCGCCCAACCGCGAGACCAAGATCGGCAAGGCC
GGCTACGTGACCGACCGCGCGCGCAAGAAGATCGTGTCCTGACCGACACCAACCAAGAAGACCGAGCTGAGGCCATCTACATCGCCCTGCAGGACTC
CGGCTCCGAGGTGAACATCGTGACCGACTCCCAGTAGCCCTGGGCATCATCCAGSCCCAGCCCAAGTCCGAGTCCGAGCTGGTGAACCAAGATCATCG
AGCAGTGTCAAGAAGGAGCGGTGTACCTGTCTGGGTGCCCCCAAGGGGATCGCGGCAACGAGCAGGTGGACAAGCTGGTGTCCAACGGCATC
CGCAAGTGTGTCTTGACGGCATCGACAAGGCCCAGGAGGAGCACGAGAAGTACCACTCCAACCTGGCGGCCATGGCCTCCGACTTCAACCTGCCCCC
CATCGTGGCCAAGGATCGTGGCCTCCTGCGACAGTGCAGTCCAGTGAAGSGCGAGGCCATGCACGGCCAGGTGGAATGCTCCCCCGGCATCTGGCAGCTGG
ACTGCACCCACCTGGAGGGCAAGATCATCTGGTGGCCGTGCACGTGGCTCCGGCTACATCGAGGCGGAGGTGATCCCCCGCGAGACCGGCCAGGAGACC
GCCTACTTTCATCTTAAGCTGGCCCGCCGCTGGCCCGTGAAGGTGATCCACACCGACAACGGCTCCAACCTTCACCTCCGCGCGCGTGAAGGCCGCTGTG
GTGGGCGGCATCCAGCAGGAGTTCGGCATCCCCATAACCCCCAGTCCAGGGCGTGGTGGATCCATGAACAAGGAGCTGAAGAAGCTGATCGGCCAGG
TGCGGACCAAGCGGAGCACTGAAGACCGCCGTGCAGATGGCCGTGTTTCATCCACAACCTTCAAGCGCAAGGGCGGCATCGGGCGCTACTCCGCGCGCGAG
CGCATCGTGGACATCATCGCCACCGACATCCAGACCCGCGAGCTGCAGAAGCAGATCATCAAGATCCAGAACTTCGCGGTGTACTACCGGACTCCCCGGA
CCCCATCTGGAAGGGCCCCCAAGCTGCTGTGAAGGGCGAGGGCGCGGTGGTGTATCCAGGACAACCTCCGACATCAAGGTGGTGGCCCCCGCGCAAGGCCA
AGATCATCAAGGACTACGGCAAGCAGATGGCCCGCGCGGACTGCGTGGCCGCGCGCCAGGACGAGGACTAA

Fig. 124B

2003_CON_10_CD_pol.OPT

TTCTTCGGGAGAACCTGGCCTTCCAGCAGCGCAAGGCCCGGAGCTGCCCTCCGAGCAGACCGCGCCCAACTCCGCCACCTCCCGCGAGCTGCGCGTGTG
GGGGCGGACAAACACCTGTCCGAGACCGGCGCCGAGCGCCGCGTGTCCCTGTCTTCCCCAGATCACCTGTGGCAGCGCCCCCTGGTGACCG
TGAAGATCGGGCCAGCTGAAGAGGCCCTGCTGGACACCGGCGCCGACACACCTGTGGAGGAGATGAACCTGCCCGCAAGTGAAGCCCAAGATG
ATCGGGGCATCGGGGCTTCATCAAGGTGCGCCAGTACGACAGATCCTGATCGAGATCTGGGCTACAGGCCATCGGCACCGTGCCCGTGAAGCTGAAGCCCCG
CCCCGTGAACATCATCGGCCGCAACCTGCTGACCCAGATCGGCTGCACCTGAACCTTCCCATCTCCCATCGAGACCGTGAGAGGCAAGATCTCC
GCATGGACGGCCCCAAGTGAAGCAGTGGCCCCGTGACCGAGGAGAAGATCAAGGCCCTGACCGGATCTGCACCGAGATGGAGAAGGAGGCAAGATCTCC
CGCATCGGCCCGAGAACCCCTAACACCCCCATCTTCGCCATCAAGAAGAGGACTCCACCAAGTGGCGCAAGCTGAGACCGTGAGGCAAGATCTCC
GCGCACCCAGGACTTCTGGAGGTGAGCTGGGCATCCCCACCCCGCGCTGAAGAAGAAGTCCGTGACCGTGTGGACGTGGCGGACGCGCTACT
TCTCCGTGCCCCGTACGAGGACTTCCGCAAGTACACCGCCTTACCATCCCTCCATCAACACGAGACCCCGGATCCGCTACCACTACACGTCTG
CCCCAGGCTGGAAGGCTCCCCCGCATCTTCAGTCTCCATGACCAAGATCCTGGAGCCCTTCCGCAAGCAGAACCCCGAGATGGTGATCTACCACTA
CATGGACGACCTGTACGTGGCTCCGACCTGGAGATCGGCCAGCACCGCATCAAGATCGAGGAGTGGCGGCCACCTGCTGAAGTGGGGCTTACCAACCC
CCGACAAGAAGCAGAAAGGAGCCCCCTTCTGTGGATGGCTACGAGTGCACCCCGACAAGTGGACCGTGCAGCCATCCAGCTGCCCGAGAGGAC
TCCTGGACCGTGAACGACATCCAGAAGCTGGTGGCAAGCTGAACCTGGGCTCCAGATCTACCCGGCATCAAGTGGCGCCAGCTGTCAAGCTGCTGCG
CGCGCCAAAGGCCCTGACCGACATCGTGGCCCTGACCGAGGAGGCCGAGCTGGAGCTGGCCGAGAACCGGAGATCTGAAGGAGGCCCGTGACGGCGTGT
ACTACGACCCCTCAAGGACCTGATCGCCGAGATCCAGAAGCAGGACCTGGAGACCTGGAGACCTGGTGGACCGACTACTGGCAGGCCACCTGGATCCCGAGTGGGAGTTCTGTGAACA
GGCAAGTACGCCAAGCGCGCACCGCCACACCAAGCAGTGAAGCAGTGAAGCGGCTGACCGGCGTGCAGAAGATCGCCAGGAGTCCATCGTGATCTGGGGCAA
GACCCCAAGTTCGGCTGCCATCCAGAAGGAGACCTGGAGACCTGGAGACCTGGTGGACCGACTCCAGTACGCTGGGCGCCGAGACCTTCTACGTGGACGGCGCCGCCAACCGCGAGACCAAGCTG
CCCCCCCCCTGGTGAAGTGTGTAACAGCTGGAGAGGAGCCCATCGTGGGCGCCGAGACCTTCTACGTGGACGGCGCCGCCAACCGCGAGCTGACACCTGGCCCT
GGCAAGGCCGGCTACGTGACCGACCGCGGCCGCGCAGAGGTGATCTCCATCACCGACACCCACCAAGAGACCGAGCTGCAGGCCATCAACCTGGCCCT
GCAGGACTCCGGCTCCGAGGTGAACATCGTGACCGACTCCAGTACGCTTCCCTGGGTGCGCCGCCAACAGGGCATCGGGGCAACGAGCAGGTGGACAAGCTGGTGTCC
AGATCATCGAGCAGCTGATCAAGAAGGAGAGGTGTACCTGTCTGGGTGCGCCGCCAACAGGGCATCGGGGCAACGAGCAGGTGGACAAGCTGGTGTCC
TCCGGCATCCGCAAGTGTCTTCTGGACGGCATCGACAAGGCCAGGAGGACGAGAGTACCAACAACACTGGCGGCCCATGGCCTCCGACTTCAA
CCTGCCCCCCGTGGTGGCCAAAGGATCGTGGCCCTCTGGCACAAGTGGCAGCTGAAGGGGAGGCCCTGCACGGCCAGGTGGACTGCTCCCCCGGCATCT
GGCAGCTGGACTGCACCCACCTGGAGGGCAAGGTGATCCTGTGGCCGTGCACGTGGCTCCGGCTACATCGAGGCCAGGTGATCCCCCGCGAGACCGGC
CAGGAGACCGCTACTTCTCTGTGAAGTGGCGGCCGTGGCCCTGAAGGTGGTGCACACCGACAACGGCTCAACTCACTCCCGCCCGGTGAAGGC
CGCTGTGTGGTGGCGGCAATCAAGCAGGAGTTCGGCATCCCCTACAACCCCCAGTCCAGGGCGTGGTGGAGTCCATGAACAAGGAGCTGAAGAAGATCA
TCGGCCAGGTGCGGACCGAGCGGAGCACCCTGAAGACCGCGTGCAGATGGCCGTGTTCATCCACAACCTCAAGCGCAAGGGCGGCATCGGGCGGTACTCC
GCCGGCAGCGCATCATCGCCACCGACATCCAGACCCAGGAGCTGCAGAAGCAGATCATCAAGATCCAGAACTTCCCGCTGTACTACCGCGA
CTCCCCGACCCCATCTGGAAGGGCCCCAAGCTGCTGTGGAAGGGCGAGGGCGCGTGGTGTATCCAGGACAACTCCGACATCAAGGTGGTGTCCCCCGCC
GCAAGGTGAAGATCATCAAGGACTACGGCAAGCAGATGGCGCGCGCGCACTGCGTGGCTCCCCCGCAGGACGAGGACCCAG

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Fig. 125A

82. 2003 CON 11 CPX pol. PEP

FFRENLAFOQGEAREFSEQARANSPTRELVRGGDSPLPETGAEGEAGISFNFPQITLWQRPLVTIKVAGQLKEALLDTGADDTVLEEDI
 LPGRWKPKMIGGIGGFIKVRQYEEIIIEIEGKKAIGTVLGPFPVNIIGRNMLTQIGCTLNFPISPIDTPVKLPGMDGPKVKQWPLTEEK
 IKALTEICTEMEKEGKISKIGPENPYNTPVFAIKKKDSTKWRKLVDFRELNRKTQDFWEVQLGIPHPAGLKKKKSVTLDVGDAYFVSPLDE
 SFRKYTAFTIPSINNETPGIRYQYNVLPQGWKGSPIFQSSMTKILEPFTONPEIYIYQYMDLTVGSDLEIGQHREKVEELRKHLWKWGF
 TTPDKKHQKEPPFLWMGYELHPDKWTVPQIQLPDKECWTVDIQLVGLKNWASQIYPGKVKQLCKLRLGTKALTDIVPLTAAEAELELAEN
 RELKEPVHGVYDPSKDLIAEVQKQGLDQWTYQIYQEPFKNLKTGKYAKRRRTAHTNDVRQLAEVVQKISMESIVIWGKIPKFERLPQIRETW
 ETWWTDYWQATWIPWEFVNTPLVLWYOLEKEPIIGAETFYVDGAANRETGLGKAGYVTDKGRQKVVTITETTNQKTELEAIHLALQDSG
 LEVNIIVTDSQYALGIIQAQPKSESELVSOIIEQLIKKEKVYLSWVPAHKGIGGNEQVDKLVSSGIRKVLFLDGDIDKAQEEHRYHNSWRAM
 ASDFNLPPIVAKELIVASCDCQKLGEMHGQVDCSPGIWQLDCTHLEGGKIIILVAVHVASGYIEAEVIPAETGQETAYFILLKLAGRWPVKVIH
 TDNGSNFTSAAVKAACWMANIQEFGIPYNPQSQGVESMNKELKKIIGQVREQAEHLKTAVQMAVFIHNEFRKGGIGGYSAGERIVDIIAT
 DLQTKELQKQITKIQNFVRYRDSRDPWKGPAKLLWKGEAVVIQDNSDIKVVPRRKAKIIRDYGMAGDDCVAGRQDED\$

Fig. 126A

83. 2003 CON 12 BF pol. PEP

FFRENLAFOQGEAREFSEQARANSPTRELWVRGDNPLSEAGAERRGTVPSSLSPFPQITLWQRPLVTIKVGGQLKEALLDTGADDTVLEEDI
 NLPGRWKPKMIGGIGGFIKVKQYDNILIEICGHKAIGTVLGPFPVNIIGRNMLTQIGCTLNFPISPIDTPVKLPGMDGPKVKQWPLTEEK
 KIKALTEICTEMEKEGKISKIGPENPYNTPVFAIKKKDSTKWRKLVDFRELNRKTQDFWEVQLGIPHPAGLKKKKSVTLDVGDAYFVSPLD
 KDFRKYTAFTIPSINNETPGIRYQYNVLPQGWKGSPIFQSSMTKILEPFRKQNPDIYIYQYMDLTVGSDLEIGQHRTKIEELRQHLLRWG
 FTTPDKKHQKEPPFLWMGYELHPDKWTVPQIQLPEKDSWTVDIQLVGLKNWASQIYPGKVKQLCKLRLGTKALTEVPIPLTKEAELELAE
 NREILKEPVHGVYDPSKDLIAEIQKQGGQWTYQIYQEPFKNLKTGKYARMGAHTNDVKQLTEAVQKITTESIWIWGTTPKFERLPILKET
 WDTWTEYWQATWIPWEFVNTPLVLWYOLETEPIAGAEFTFYVDGASNRETKKKAGYVTDGRQKAVSLTETTNQKAELEHAIQLALQDS
 GSEVNIIVTDSQYALGIIQAQPKSESELVNOIIEQLIKKEKVYLSWVPAHKGIGGNEQVDKLVSAIRKILFLDGDIDKAQEEHRYHNNWRA
 MASDFNLPVVAKEIVASCDCQKLGEMHGQVDCSPGIWQLDCTHLEGGKIIILVAVHVASGYIEAEVIPAETGQETAYFILLKLAGRWPVKTI
 HTDNGPNFSSAAVKAACWMANIQEFGIPYNPQSQGVESMNKELKKIIRQVRDQAEHLKTAVQMAVFIHNEFRKGGIGGYSAGERIIDIIIS
 TDIQTRRELQKQIKIQNFVRYRDSRDPWKGPAKLLWKGEAVVIQDNSEIKVVPRRKAKIIRDYGMAGDDCVAGRQDED\$

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Fig. 125B

2003_con_11_cpx_pol.OPT
TTCTTCGCGAGAACCTGGCCTTCCAGCAGGGCGAGGCCCCGGAGTTCTCCCCGAGCAGGCGCGCGCCCAACTCCCCACCTCCCCCGCAGCTGCGCGTGCG
CGCGCGGACTCCCCCTGCCCCAGACCGGCGCCGAGGGCGCATCTCCTTCAACTTCCCCCAGATCACCTGTGGCAGCGCCCCCTGGTGACCA
TCAAGTGGCGGCGCAGTGAAGGAGGCCCTGCTGGACACCGCGCCGACACCCGCTGCTGGAGGAGATCGACCTGCCGCGCGCTGGAAGCCCAAGATG
ATCGCGGCATCGCGGCTTCAATCAAGTGGCGCAGTACGAGGAGATCATCGAGATCGAGGGCAAGAGCCCATCGGCACCCGCTGCTGGTGGCCCCC
CCCCGTGAACATCATCGCGCGCAACATGCTGACCCAGATCGGTGCACTTGAACCTTCCCCATCTCCCCATCGACCCGCTGAGCTGAAGCTGAAGCCCCG
GCATGGACGGCCCCAAGGTGAAGCAGTGGCCCCCTGACCGAGGAGAGATCAAGGCCCTGACCCGAGATCTGCACCGAGATGGAGAAGGCAAGATCTCC
AAGATCGGCCCCGAGAACCCCTACAACACCCCCGTGTTCCCATCAAGAAGAAGACTCCACCAAGTGGCGCAAGCTGGTGGACTTCCGCGAGCTGAACAA
GGCACCCAGGACTCTGGGAGGTGAGCTGGGCATCCCCACCCCGCGGCTGAAGAGAAAGTCCGTGACCGTGTGGACGTGGCGACGCCCTACT
TCTCCGTGCCCCCTGGACGAGTCTTCCGCAAGTACACCGCTTCAACCATCCCTCCATCAACAAGAGACCCCGCATCCGACCCAGAACCCCGAGATCGTGATCTACCA
CCCCAGGCTGGAAGGCTCCCCCGCATCTCCAGTCTCCATGACCAAGATCCTGGAGCCCTTCCGACCCAGAACCCCGAGATCGTGAGTGGGCTTCAACACC
CATGGACGACCTGTACGTGGCTCCGACCTGGAGATCGGCCAGCACCCGAGAGAGTGGAGGAGTGGCAAGCATCTGCTGAAGTGGGCTTCAACACC
CCGACAAGAACACCAAGAGGAGCCCCCTTCTGTGGATGGGTACGAGTGCACCCCGACAAGTGGACCGTGCAGCCCATCCAGCTGCCCCGACAAGGAG
TGCTGGACCGTGAACGACATCCAGAACGCTGGTGGCAAGCTGAACCTGGGCTTCCAGATCTACCCGGCATCAAGTGAAGCAGCTGTGCAAGCTGTGCG
CGCACCAAGGCCCTGACCGACATCGTGCCCCCTGACCGCGAGCTGGAGCTGGCCGAGAACCGCGAGATCTGAAGGAGCCCCGTGCACGGCGTGT
ACTACGACCCCTCAAGGACCTGATCGCCGAGGTGCAGAACGAGGCCCTGGACCAAGTGGACCTACCAAGATCTACAGGAGCCCTTCAAGAACCTGAAGACC
GGCAAGTACGCCAAGCGCGCACCGCCACACCAAGACGTGGCCGAGTGGCCGAGGTGGTGCAGAGATCTCCATGGAGTCCATCGTGATCTGGGGCAA
GATCCCCAAGTTCGCGCTGCCCATCCAGCGCAGACCTGGGAGACCTGGTGACCCGACTACTGGCAGGCCACCTGGATCCCCGAGTGGGAGTTCGTGAACA
CCCCCCCCCTGGTGAAGCTGTGTACCAAGTGGAGAGGAGCCCATCATCGCGCGCGAGACCTTCTACGTGGACGGCGCGCCCAACCGCGAGACCAAGCTG
GGCAAGCGCGCTACGTGACCGACCAAGGCGCGCAGAGGTGTGACCTGACCGAGACCAACCAAGAGACCGAGCTGGAGGCCATCCACCTGGCCCT
GCAGGACTCCGCGCTGGAGGTGAACATCGTGACCGACTCCAGTAGGCCCTGGGCATCATCCAGGCCAGCCCCGACCAAGTCCGAGTGGTGTCCC
AGATCATCGAGCAGCTGATCAAGAAGGAGAGGTGTACCTGTCTGGTGCGCGCGAGGACGAGCGCTACCACTCCAACTGGCGCGCCATGGCCTCCGACTTCAA
TCCGGCATCCGCAAGGTGTTCTTGACCGCATGACAAGGCCAGGAGGACGAGCGCTACCACTCCAACTGGCGCGCCATGGCCTCCGACTTCAA
CCTGCCCCCATCGTGGCCAAAGGAGATCGTGGCCCTCTGGCAAGTGGCAGCTGAAGGCGAGGCCATGCACGGCCAGGTGGACTGCTCCCCCGGCATCT
GGCAGTGGACTGCACCCACCTGGAGGGCAAGATCATCTGGTGGCGTGCACGTGGCCTCGGCTACATCGAGGCCGAGGTGATCCCCCGCGAGACCGGC
CAGGAGACCGGCTACTTCTCATCTGAAGTGGCGCGCGCTGGCCCTAACCCTACACCCCGAGTCCACACCGACAACGGCTCCAACTTCACTCCGCGCGCTGAAGG
CGCTGCTGGTGGGCCAACATCCAGCAGGAGTTCGGCATCCCCCTAACCCCGAGTCCAGGGCGTGGTGGAGTCCATGAACAAGGAGCTGAAGAAGATCA
TCGGCCAGGTGGCGGAGCAGGCCGAGCACCTGAAGACCGCGTGCAGATGGCCGTGTTCTATCCACAACCTTCAAGCGCAAGGGCGGCTACGGCGGCTACTCC
GCCGCGAGCGCATCGTGGACATCATCGCCACCGACCTGCAGACCAAGGAGCTGCAGAGCAGATCACCAAGATCCAGAACTTCCGCGGTGTACTACCGGGA
CTCCCCGACCCCATCTGGAAGGGCCCCCAAGCTGCTGTGGAAGGGCGAGGGCGCGCTGGTGTATCCAGGACAACTCCGACATCAAGGTGGTGGCCCCGCC
GCAAGGCCAAGATCATCCGCGACTACGGCAAGCAGATGGCCGGCGCAGCACTGCGTGGCGCGCGCCAGGACGAGGACTAA

Fig. 126B

2003_CON_12_BF_pol.OPT

TTCTTCCGGAGAACTGGCCCTCCAGCAGGGCGAGGCCCGCAAGTTCCCTCCGAGCAGGCCCGGCCAACTCCGCCCTCCCGGAGCTGTGGGTGGC
CCGGCGGACAAACCCCTGTCCGAGGCCGGCGGAGCGCGGACCGTGCCTCCCTGTCTTCCCTCCAGATCACCTGTGGCAGCGCCCTCGGTGA
CCATCAAGGTGGCGGCAGCTGAAGGAGGCCCTGTGGACACCGGCGGACGACACCGTGTGGAGGACATCAACTGCCCGGCAAGTGGAAAGCCCAAG
ATGATCGGCGGCATCGGCGGCTTCATCAAGTGAAGCAGTACGACAACATCCTGATCGAGATCTGGGGCCCAAGGCCATCGGCACCGTGTGGTGGGCCC
CACCCCGTGAACATCATCGGCGCAACCTGCTGACCCAGCTGGGCTGCACCTGAACCTTCCCATCTCCCATCGAGACCGTGCCTGAAGCTGAAGC
CCGGCATGGACGGCCCCAAGTGAAGCAGTGGCCCTGACCGAGGAGAGATCAAGGCCCTGACCGAGATCTGACCGAGATGGAGAGGAGGCAAGATC
TCCAGATCGGCCCCGAGAACCCCTACAACACCCCGTGTCCCATCAAGAAGAGTCCACCAAGTGGCGCAAGCTGGTGAATTCGCGAGCTGAA
CAAGGCACCCAGGACTTCTGGAGGTGCAGCTGGCATCCCCACCCCGCGGCTGAAGAAGAAGTCCGTGACCGTGTGGAGCGGAGCGCT
ACTTCTCCGTGCCCTGGACAAGGACTTCGGCAAGTACACCGCTTACCATCCCTCCGTGAACAACGAGACCCCGGCATCCGCTACAGTACAACGCTG
CTGCCCCAGGGCTGGAAGGCTCCCCCGCATCTTCCAGTCTCCATGACCAAGATCTTGAGCCCTTCGGCAAGCAGAACCCCGACATCGTGATCTACCA
GTACATGGACGACCTGTACGTGGCTCCGACCTGGAGATCGGCCAGCACCGCACCAAGATCGAGAGCTGCGCCAGCACCTGCTGGCTGGGCTTCAACA
CCCCGACAAGAACCAAGAGGAGCCCCCTTCTGTGGATGGCTACGAGCTGACCCCGACAAAGTGGACCGTGCAGCCCATCGTGTGCCCGAGAAG
GACTCTGGACCGTGAACGACATCCAGAAAGCTGGTGGCAAGCTGAACCTGGGCTCCAGATCTACCCCGCATCAAGGTGAAGCAGCTGTGCCGCTGCT
GCGGGCACCAAGGCCCTGACCGAGGTGATCCCCGTGACCAAGAGGCGGAGCTGGAGCTGGCGAGACCGCGAGATCTCTGAAGGAGCCCGTGCACGGCG
TGTAACGACCCCTCCAGGACCTGATCGCGAGATCCAGAAGCAGGGCCAGGCCAGTGGACCTACCAGATCTACCAGGAGCCCTTCAAGAACCTGAAG
ACCGCAAGTACGCCCGCATGCGGGCGCCACACCAACGACGTGAAGCAGTGAACGAGCCGTGCAGAGATCAACCGAGTCCATCGTGATCTGGGG
CAAGACCCCAAGTTCCGCTGCCATCCTGAAGGAGACCTGGGACACCTGTTGGACCGGACCTTGGCAGGCCACCTGGATCCCGAGTGGGAGTTCGTGA
ACACCCCCCTGTGAAGCTGTGTACAGCTGGAGACCGAGCCCATCGCCGGCGCGGAGACCTTCTACGTGGACGGCGCTCCACCCGAGACCAAG
AAGGCAAGGCCGGCTACGTACCGACCGCGCGCCAGAAAGCCGTGTCCCTGACCGAGACCAACCAAGAGGCGGAGCTGCAGCCATCCAGCTGGC
CCTGAGGACTCCGGTCCGAGGTGAACATCGTGACCGACTCCAGTACGCCCTGGGCATCATCCAGGCCAGCCCGACAAGTCCGAGTCCGAGCTGGTGA
ACCAGATCATCGAGCAGCTGATCAAGAAGGAGAAAGTGTACCTGTCTCTGGTGCCGCCACAAGGGCATCGGCGGCAACGAGCAGGTGGACAAGCTGGTG
TCCGCGGCATCCGCAAGATCTTCTTGACGSGATCGACAAGGCCCGAGGAGGACGAGAAATACCAACAACAACTGGCGCGCCATGGCCTCCGACTT
CAACCTGCCCCCGTGGTGGCCAGGAGATCGTGGCTTCTGCGACAAGTGCAGCTGAAGGCGGAGGCGCATGCAGGCCAGGTGGAATGCTCCCCGGCA
TCTGGCAGTGAATGACCCACCTGGAGGGCAAGATCATCTGTGTGGCCGTGCAGCTGGCTCCGGCTACCTGGAGGGCCGAGGTGATCCCCGCGGAGACC
GGCAGGAGACCGCTACTTCATCTGAAGTGGCGGCGCTGGCCGTGAAGACCATCCACACCGACAACCGGCCCAACTTCTCTCCGCGCGCTGAA
GGCGGCTGTGTGGCGCGCATCCAGCAGGAGTTCGGCATCCCCCTACAACCCCGTCCAGGGCGTGTGGAGTCCATGAACAAGGAGCTGAAGAAGA
TCATCCGCCAGGTGGCGGACCAAGCCGCGTGCAGATGGCCGTGTTCATCCACAACCTTCAAGCGCAAGGGCGGCGATCGGGCGGCTAC
TCCGCGGCGGAGCGCATCATCGACATCATCTCACCGGACATCCAGACCCCGAGCTGCAGAAGCAGATCATCAAGATCCAGAACTTCCGCGTGTACTACCG
CGACTCCCGGACCCCGTGTGAAGGCCCCCGCAAGCTGCTGTGAAGGGCGGAGGCGCGGTGTGATCCAGGACAACCTCCAGATCAAGGTGGTGGTCCCC
GGCGAAGGCCAAGATCATCCGCGACTACGGCAAGCAGATGGCCGGCGACGACTGCGTGGCCGCGCCCGCAGGACGAGGACTAA

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Fig. 127A

84. 2003 CON 14 BG pol. PEP
FFRENLAFOQGEAREFESPEQARANSPTRRRELWVRRGDSPLPEAREGKGDIPLSLPOITLWQRPPLVTVRIGGQLIEALLDTGADDTVLEDIN
LPGWKPKMIGGIGGFIVKVRQYDQILIEICGKKAIGTVLVGPTPINIIGRNMLTQIGCTLNFPISPIETVPVKLPGMDGPKVKQWPLTEEK
IKALTDICTEMEREGKISKIGPENPYNTPIFAIKKKDSTKWRKLVDFRELNRKTQDFWEVQLGIPHPSGLKKKSVTVLVDVGDAYFSVPLDE
SFRKYTAFTIPSTNNETPGIRYQYNVLPQGWKGPSPAIQSSMTKILEPFRIKNPEIYIYQYMDLQVGSDEIGQHRAKIEELRKHLLSWGF
TTPDKKHQKEPPFLWVGVELHPDKWTVQPIQLPKESWTVNDIQKLVGKLNWASQIYPGKVKQCLLGRGAKALTDIVPLTAEAELELAEN
REILKEPVHGVVYEPSEKELIAEVQKQGLDQWTYQIYQEPYKNLKTGKYAKRGSAHTNDVKQLTEVVQKIATESIVIWGKTPKFKLPIRKETW
EVWTEYWQATWIPDWEFVNTPLVKLWYRLETEPIAGAEYIYVDGAANRETKLKGAGYVTDKGQKIIITLTETTNQKAELOAIHIALQDSG
SEVNIVTDSQYALGIIQAQPDSESEVNVQIIIEQLIKKEKVYLSWVPAHKGIGGNEQVDKLVSSGIRKVLFLDGDIDKAQEEHEKHYHSNWRAM
ASDFNLPPVVAKEIVASCDCQQLKGEAMHGQVDCSPGIWQLDCTHLEGKIILVAVHVASGYIEAEVIPAETGQETAYFILKLAGRWPVKI IH
TDNGSNFTSAAVKAAACWWANITQEFGIPYNPQSQGVVESMNKELKKIIGQVRDQAEHLKTAVMQMAVFIHNFRRKGGIGGYSAGERIIDIIAS
DIQTKELQKQITKIQNFRVYFRDSRDPPIWKGPALLWKGEVAVVIOQDNNKIKVPPRRKAKIIRDYKGQKQAGDDDCVAGRQDED\$

Fig. 127B

2003_con_14_BG pol. OPT

TTCTTCCGCGAGAACCTGGCCTTCCAGCAGGGCGAGGCCGCGAGTTCTCCCGGAGCAGGGCCCGGCCCAACTCCCCACCCCGCGGAGCTGTGGGTGCG
CCGCGGCGACTCCCCCTGCCCCGAGGCCCGCGCGAGGGCAAGGGCGACATCCCTGTCCCTGCCCCAGATCACCTGTGGCAGCGCCCCCTGGTGACCG
TGCGCATCGCGCGCAGCTGATCGAGGCCCTGCTGGACACCGGCCGACGACACCTGCTGGAGGACATCAACCTGCCCGCAAGTGAAGCCCCAAGATG
ATCGCGCGCATCGCGGCTTCTCAAGGTGGCCAGTACGACAGATCTTATCGAGATCTGGGGCAAGAGGCTCGGCACCGTCTGTGGTGGCCCCAC
CCCCATCAACATCATCGCGCGCAACATGCTGACCCAGATCGGCTGCACCTGAACCTCCCATCTCCCCATCGAGACCGTGCCTGAAGCTGAAGCCCG
GCATGGACGGCCCCAAGGTGAAGCAGTGGCCCCCTGACCGAGGAGAAGATCAAGGCCCTGACCGACATCTGCACCGAGATGGAGCGGAGGCAAGATCTCC
AAGATCGGGCCCCGAGAACCTTACAACACCCCCATCTTCGCCATCAAGAAGAGGACTCCACCAAGTGGCGCAAGCTGGTGGACTTCCGCGAGCTGAACAA
GGCACCCAGGACTTCTGGAGGTGAGTGGGCATCCCCACCCCTCCGGCTGAAGAAGAAAGTCCGTGACCGTGTGGACGTGGCGGACGCTACT
TCTCCGTGCCCTGGACGAGTCTTCCGCAAGTACACCGCCTTCAACATCCCTCCACCAACAACGAGACCCCCGGCATCCGCTACCAAGTACAACGCTGTG
CCCCAGGGCTGAAGGCTCCCCCGCATCTTCCAGTCTCCATGACCAAGATCTCTGGAGCCCTTCGCGATCAAGAACCCCGAGATCGTGATCTACCACTA
CATGGACGACCTGTACGTGGCTCCGACCTGGAGATCGGCCAGACCCGCCAAGATCGAGGAGCTGGCAAGCACTGTCTCTCTGGGCTTCAACACCC
CCGACAAGAACCAAGAGAGCCCCCTTCTGTGGATGGCTACGAGCTGACCCCGCAAGTGGACCGTGAAGCCCATCCAGCTGCCCGGACCAAGGAG
TCTTGACCGTGAACGACATCCAGAAGCTGGTGGCAAGCTGAACCTGGGCTCCAGATCTACCCCGCATCAAGGTGAAGCAGCTGTGCAAGCTGTGCG
CGCGCCAAGGCCCTGACCGACATCGTGCCCTGACCGCGAGGCCGAGCTGGAGCTGGCCGAGAACCCGCGAGATCTTGAAGGAGCCCGTGCACGGCGTGT
ACTACGAGCCCTCAAGGAGCTGATCGCCGAGGTGCAGAACGAGGCCCTGGACCAAGTGGACCTACCAGATCTACAGGAGCCCTACAAGAACCTGAAGACC
GGCAAGTACGCCAAGCGGGCTCCGCCCAACCAACGACGTGAAGCAGCTGACCGAGGTGGTGCAGAAAGATCGCCACCGAGTCCATCGTGATCTGGGGCAA
GACCCCAAGTTCAAGCTGCCCATCCGCAAGGAGACCTGGGAGGTGTGGTGAACCGAGTACTGGCAGGCCACCTGGATCCCGACTGGGAGTTCTGTGAACA
CCCCCCCCCTGGTGAAGCTGTGGTACCGCTGGAGACCGAGCCCATCGCCGGCGCGAGACCTACTACGTGGACGGCGCCCGCCCAACCCGCGAGACCAAGCTG
GGCAAGGCGGGCTACGTGACCGACAAAGGGCAAGCAGAAAGATCATACCTGACCGAGACCAACCAACAGAGCCGAGCTGCAGGCCATCCACATCGCCCT
GCAGGACTCCGGCTCCGAGGTGAACATCGTGACCGACTCCAGTACGCCCTGGGCATCATCCAGGCCAGCCCGACCGCTCCGAGTCCGAGGTGGTGAACC
AGATCATCGAGCAGCTGATCAAGAAGGAGAGGTGTACCTGTCTGGGTGCCCGCCCAAGGGCATGGCGGCAACGAGCAGGTGGACAAGCTGGTGTCC
TCCGGCATCCGCAAGGTGTCTTCTGGACGGCATCGACAAGGCCCGAGGAGCAGCAGAGAAGTACCACTCCAATGGCGGCCCATGGCTCCGACTCAA
CCTGCCCCCGTGGTGGCCAGGAGATCGTGGCCCTCCTGCGACAAGTGCAGCTGAAGGGCGAGGCCATGCAGGCCAGGTGGACTGCTCCCCCGGCTCT
GGCAGTGGACTGCACCCACCTGGAGGGCAAGATCATCTGTGTGGCCGTGCACGTGGCCCTCCGGCTACATCGAGGCCGAGGTGATCCCCGCGAGACCGGC
CAGGAGACCGCCTACTTCTGAAGCTGGCCGCGCTGGCCGTGAAGATCATCCACACCGACAAACGGCTCCAACCTCACCTCCGCGCCCGCTGAAGGC
CGCCTGTGTGGGCCAACATCACCAAGGATTCGGCATCCCCATAACCCCCAGTCCCAGGGCGTGGTGGAGTCCATGAACAAGAGCTGAAGAGATCA
TCGGCCAGGTGGCGGACCGAGACCTGAAGACCGCCGTGCAGATGGCCGTGTTCATCCACAACCTTCAAGCGCAAGGGCGGCTATCGCGGGCTACTCC
GCCGCGAGCGCATCATCGACATCATCGCCTCCGACATCCAGACCAAGGAGCTGCAGAAGCAGATCACCAAGATCCAGAACTTCCGCGTGTACTTCCGCGA
CTCCCCGACCCCCATCTGGAAGGGCCCCGCCAAGCTGTGTGGAAGGGCGAGGGCCCGTGGTGTATCCAGGACAACAACGAGATCAAGGTGGTGGCCCCGC
GCAAGGCCAAGATCATCCGCGACTACGGCAAGCAGATGGCCCGCGGACGACTGCGTGGCCCGCGCCAGGACGAGGACTAA

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